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ABSTRACT

An evaluation study of some work preparation (or pre-vocational education) programs in New South Wales and Queensland (Australia) was conducted to accomplish the following objectives: (1) to establish a general methodological framework for the continuing evaluation of Technical and Future Education (TAFE) pre-vocational programs; (2) to obtain a worthwhile assessment of the effectiveness of a selected number of work preparation programs currently offered; and (3) to identify major problems and factors which could guide the future development of work preparation programs. In developing a strategy for the evaluation of TAFE pre-vocational education programs, a start was made by examining the main aspects of its rationale and the key features of four programs in this field. The results of this examination enabled general approaches to educational evaluation to be incorporated in an evaluation framework for pre-vocational education. Subsequently, it was possible to identify data which needed to be collected about each element of the framework and to suggest instruments which might be used for this purpose. Finally, suggestions were made of means by which data gathered about each element in the framework could be used in further analyses. (This report is primarily concerned with the first objective and contains a description of some new developments in pre-vocational education, a discussion of the rationale for programs in this area, and an outline of an evaluation approach.) (BM)

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BETWEEN SCHOOL AND ADULT LIFE: AN APPROACH TO THE EVALUATION OF PRE-VOCATIONAL EDUCATION IN TAFE

JOHN AINLEY
and
ADRIAN FORDHAM

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U.S. DEPARTMENT OF HEALTH,
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CHAPTER 1

INTRODUCTION

Background to the Study

Technical and Further Education encompasses a wide range of programs offered in a range of institutions and agencies. In essence it is concerned with post school education other than that provided at universities or the advanced education level in colleges of advanced education. The activities which are seen as being the responsibility of TAFE institutions are:

1 vocational training for a trade or other skilled occupation either as initial preparation, specialization, or updating existing knowledge,

2 preparatory or bridging courses prior to vocational training,

3 retraining for people returning to work or changing jobs, and

4 personal enrichment and other programs not directly related to training for work.

It is worth noting that whilst the emphasis on vocational education in Technical and Further Education is strong, it has been broadly defined. The Report of the Australian Committee on Technical and Further Education (1974) argued strongly against conceiving vocational education as a narrow form of training concerned solely with the development of skills. It was stressed that narrowly conceived skill training was disadvantageous to the individual, both in terms of not acknowledging personal development, and in not creating the basic understanding necessary for continuing education. A shift in emphasis was urged. The needs of individuals to develop their abilities was to be accorded higher priority relative to the manpower demands of industry. The change may have been only one of emphasis, but the recognition in the report of the importance of balancing the needs of industry and individuals was a public acknowledgment of the broad role of vocational education.

In addition to an emphasis on broadly defined vocational education, a key characteristic of Technical and Further Education is its responsiveness to individual, community, and industry needs. Sometimes this is emphasized in the claim that Technical and Further Education is more clearly within the 'service', than the 'autonomous' tradition of post-secondary education (Coughlan, 1977). While such a distinction is probably more blurred than is currently recognized, its expression does emphasize a point held by many in

Technical and Further Education. By comparison with a university, an institution of Technical and Further Education places less emphasis on academic rigour in selection, on the advancement of knowledge in established disciplines, and research. Rather it emphasizes responsiveness to demand, teaching 'useful' skills, and open admission.

As a consequence of these aspects of their rationale, institutions providing Technical and Further Education have been engaged in developing new courses, and modifying existing courses, in response to changing economic circumstances. Among several important changes in economic circumstances over the past few years have been:

1 an increase in the general level of unemployment,

2 a marked increase in the level of youth unemployment,

3 changes in the structure of manufacturing and service industries, and

4 a decline in the capacity of some industries to provide the components of vocational education which they previously provided.

Given that Technical and Further Education is committed to being responsive to changing circumstances, the issue of program evaluation is one of great importance. Decisions about the development of new programs, the modification of existing programs, or even the discontinuance of some programs need to be made on the basis of as much information as possible. Evaluation has been defined as 'the process of delineating, obtaining, and providing useful information for judging decision alternatives' (Stufflebeam et al., 1971:40). As such, a commitment to evaluation is a necessary concomitant of a commitment to responsiveness. Evaluation should provide some guidance as to whether new, or previously existing programs, are meeting the needs for which they were intended, and what modifications should be made to them.

The Brief

Against this background the Technical and Further Education Commission approached the Australian Council for Educational Research with a request to undertake an evaluation study of some work preparation (or pre-vocational education) programs. There were three objectives specified for the project.

1 To establish a general methodological framework for the continuing evaluation of TAFE programs designed to prepare people for working life. This framework was to be capable of adaptation and modification as necessary to meet the needs of particular TAFE authorities for the future evaluation of their own programs in this area.

2 To obtain a worthwhile assessment of the effectiveness of a selected number of work preparation programs currently offered in Technical and Further Education.

3 To identify major problems and factors which could guide the future development of work preparation programs in Technical and Further Education.

The brief indicated that a major purpose of the study was the establishment of 'a sound methodological basis on which Technical and Further Education authorities themselves can assess the effectiveness of their current work preparation programs and plan the development of future programs'. It was recognized that a comprehensive evaluation of current programs would be difficult because of the recent origins of the programs. For these reasons it was envisaged that the evaluation studies mentioned in objective two would be part of the developmental work associated with the methodology.

Within the statement of the first objective there was only a general indication of the types of program to which the methodology should be applicable: those which prepare young people for working life. An early stage in the project, described in Chapter Two, involved delineating a more precise definition of the type of program involved.

There was an explicit indication with the stated objective of three other points which have guided the project. These were that the evaluation methodology should be general, adaptable, and directed towards the requirements of Technical and Further Education Authorities. It is worth considering these three points in a little more detail.

The programs being considered in the present study ranged over diverse occupational areas. In each there were goals which were general goals and others which were specific to particular programs. Consequently the general framework for evaluation was developed in a way which drew attention to both types of goal. Some elements of the evaluation framework were generally applicable to all programs, while other elements were specific to particular programs. In the application of the evaluation methodology attention has been focussed on the general issues involved in the transition from school to work rather than on specific occupational skills. By concentrating on these more general issues it was possible to make the best use of the resources available. A specific skills oriented approach would have been of more limited use.

By separating the general from the specific elements of an evaluation of pre-vocational education programs we have attempted to indicate that such an approach to evaluation can be adaptable. Specific methods of evaluation suited to particular objectives of different programs can be incorporated within a general framework. In brief, provision for adapting the approach outlined in this report has been made by distinguishing specific elements of particular pre-vocational education programs from general elements common to all such programs.

One problem in developing strategies for evaluation is often that of defining the client group. In this project it was stated that the evaluation strategy should be directed towards Technical and Further Education authorities. One important consequence of this direction was that it was possible to assume that resources would be available to those groups for statistical analyses of questionnaire returns and other data. Another important consequence was that it could be assumed that those evaluating were not directly involved in teaching the program. Despite this orientation some attempt has been made to incorporate material which might also be of use for evaluation at college level.

The Report

This report is composed of two volumes. The first contains a description of some new developments in pre-vocational education, a discussion of the rationale for programs in this area, and an outline of an approach to their evaluation. The second contains the results of some trials of methods in four selected pre-vocational education programs. In brief, the first volume is predominantly concerned with the first objective of the study, while the second is predominantly concerned with illustrative data arising from trials of the methods developed.

The programs studied in this project were not necessarily typical of pre-vocational education programs in Australia in 1978. They were drawn from just two states: New South Wales and Queensland. Moreover they have been selected as representing important developments in this field: simulated work environments in college, polytechnical trade programs, the provision of extensive work experience, and the substitution of full-time for part-time study. It was considered that a research project that concentrated on the issues raised by these developments would be of more value than one which attempted to encompass the full spectrum of pre-vocational education.

In this report we have taken a broad view of the role of pre-vocational education programs. Given a context of limited employment opportunities for young people, and changes in the demand for different types of skills such a perspective seemed appropriate. Rather than concentrate on the development of particular skills for predefined occupations we have considered the role of these programs in facilitating the transition of young people from school to adult life. Preparation for work has certainly been recognized as an aspect of this transition relevant to the present study, but we have also been concerned with the role of pre-vocational education in the development of students who are better able to participate in adult life.

The Context

Pre-vocational education has emerged as an important area of interest in recent times. The Committee of Inquiry into Education and Training, as a result of its examination of trade training recommended 'a progressive movement to a substantial component of pre-employment education and training' (Australia, 1979 (3):29). In support of such a shift in emphasis the Committee argued that structural change had reduced the basis for effective training in some industries, that economic fluctuation had caused reductions in the number of apprentices, and that technological change had created new demands on training systems. The committee noted that there were differences in opinion on the best methods of trade training. It cited submissions which argued against any further shift towards full-time trade training other than initial training (Australia, 1979 (1):305-306). The arguments against full-time training related to the cost of training and the need to ensure that training reflected actual work methods. With regard to this latter point, the Committee noted the observations of a previous study group which had reviewed full-time training methods in Europe. That group had expressed reservations about the lack of practical workshop experience in those courses (Australia, 1969). As a consequence the Committee favoured a mixed system involving a substantial component of pre-employment education as part of the method of trade training. However it was suggested that the increase in pre-employment training should be gradual and in only a few trades at first.

According to this view the evaluation of pre-vocational education would play an important role in the evolution of new structures of vocational training. In this report some approaches to such evaluation studies have been suggested. The approaches suggested have been concerned with educational aspects of programs of pre-vocational education. Other important aspects of the provision of such programs were beyond the scope of the study.

It is important to recognize that the main thrust of this report is the development of a general framework for evaluation rather than the prescription of a detailed procedure. In any evaluation study of a program on pre-vocational education it will still be important to identify the important evaluation question most relevant to that particular program and determine the most appropriate procedures for gathering evidence. The detailed procedures tried as part of the present study constitute only one of a number of possible ways in which the general framework might be used.

CHAPTER 2

PRE-VOCATIONAL EDUCATION : ITS RATIONALE

Types of Program

A great many of the educational programs offered in Technical and Further Education institutions could be considered to involve work preparation. Indeed an important component of many courses in other forms of post-secondary education is preparation for work. The present project has been deliberately confined in its scope in two ways. Firstly, it has been confined to programs conducted in institutions of Technical and Further Education. Secondly, and additionally, only a particular group of programs has been considered. This group has been called pre-vocational education programs. The term 'pre-vocational' has been used in a generic sense to include a wide range of programs rather than one specific course of study.

The essential element of all these educational programs being considered is that they provide a course of full-time training for young people prior to commencing work. In general pre-vocational programs admit students after compulsory schooling finishes at about Year 10. Thus they begin at the basic post-secondary level equivalent in age to the first stage of an apprenticeship. Programs which fit these general criteria vary in vocational specificity, the extent to which they are planned to lead to further training, and the time taken to complete the course.

There are four important groups of educational programs in Technical and Further Education which can be classed as pre-vocational in the sense described above.

1 Pre-apprenticeship programs which are intended to lead directly to an apprenticeship in a particular trade. Completion of such a course may involve some reduction in the duration of an apprenticeship and the educational requirements of an apprenticeship.

2 Full-time courses intended to provide work preparation in occupational areas which have not been involved in the apprenticeship system. One such area is that of office or clerical work.

3 Polytechnical courses designed to provide an introduction to a range of trades with some specialization later in the course. These courses may be intended to lead to an apprenticeship but might not necessarily involve a reduction in the term of the apprenticeship.

4 Courses of full-time study intended to lead to a combination of work and further part-time study though not subject to the apprenticeship system.

In 1978 the duration of most of the programs considered to be pre-vocational was one year. However there were several specific pre-apprenticeship courses which were only 14 weeks long (e.g. the pre-apprenticeship Signwriting course in Queensland) while others extended over 54 weeks (e.g. one form of the Carpentry and Joinery course in New South Wales).

The Background to Pre-Vocational Education: An Overview

Recently there has been increased attention given to educational programs designed to facilitate the transition of young people from school to work. Manifestations of this concern can be found in the variety of work experience programs offered in secondary schools (Blakers, 1978:349-406), linked courses (Blakers, 1978:415-432; Catts 1978), and in the general move to include more vocationally oriented subjects in the general secondary curriculum. Pre-vocational education programs in Technical and Further Education institutions have also been seen as a means of assisting young people move from school to work (TAFEC, 1977:125). Central to this view of the role of pre-vocational education is the belief that the development of general and specific vocational skills through these courses will facilitate the transition from school to work.

Concern with the transition from school to work is not the only factor which has aroused interest in pre-vocational education. Three other factors appear to be involved in the development of these programs:

1 meeting the changing manpower demands of industry,

2 overcoming difficulties in the apprenticeship system, and

3 providing a suitable curriculum for the greater diversity of abilities and interests that characterize pupils now remaining at school to senior levels.

These three factors can be linked to the aims of pre-apprenticeship courses submitted to the Committee of Inquiry into Education and Training by the New South Wales Department of Technical and Further Education (Australia, 1979 (1): 298-299). That submission classified the aims of pre-apprenticeship as primary and secondary. Primary aims concerned the transition from school to work through the development of vocational skills which matched the needs of industry. Secondary aims concerned the personal development of individuals as members of society. Thus these primary and secondary aims of pre-apprenticeship courses correspond to the major factors which appear to be important in arguments for the development of pre-vocational education in general.

The importance of each of these factors differs for different types of program, and varies over time as economic circumstances change. However, all four are given some recognition in the stated rationale for most pre-vocational programs. Issues related to the role of pre-vocational education in the transition from school to work will be considered in greater detail later in this chapter. Prior to discussing those issues it is worth considering the other three factors often included in the rationale for pre-vocational education.

Manpower Demands

The Technical and Further Education Commission (1977:125) has suggested that two types of alleged manpower demands appear to have prompted an interest in full-time pre-vocational courses. The first was the general demand for skilled labour. The second was the episodic demand for skilled manpower as industry emerges from a recession.

General demand

Since 1971 there appear to have been two distinct periods of change in employment in Australia. According to the Department of Employment and Industrial Relations (1978), up to June 1974 there was a strong demand for labour. By contrast in the subsequent four years to mid-1978, there was a weakening of the labour market. The decline was most marked in manufacturing industry where employment fell by 206,000 since March 1974, and building where employment fell by 60,200 since a peak in May 1975. Only in the tertiary sector which is mainly concerned with the provision of services, has there been sustained growth in employment since 1971. Since June 1974 an additional 162,000 were employed in the tertiary sector of the workforce. Moreover, of the industries other than those in the tertiary sector, surveyed by the Department of Employment and Industrial Relations, an increased demand for labour was forecast only in coal mining and electricity and gas.

The analysis cited above is concerned with the general employment demand and does not necessarily indicate the position of skilled tradesmen. It has been argued by some (National Training Council, 1977a) that even when there is high unemployment there may still be labour shortages in certain skilled occupations such as the metal and electrical trades. The Technical and Further Education Commission submitted to the Committee of Inquiry into Education and

Training as part of an argument for the development of new, and expansion of, existing forms of skill training, the view that skill shortages existed in some areas.

> At present, despite the depressed state of the economy, there are still labour shortages in certain skill areas - in the metal trades for example. Current shortages of skilled people, and trends in migration mentioned above, and demographic trends and indicating an aging of the population combine to indicate the need for urgent measures to avert a skill shortage. (TAFEC, 1977:149)

The National Training Council (1977b) identified three sources of skilled manpower: migration, upgrading and apprenticeship training. It was claimed that migration had ceased to be a major source of skilled manpower both because the general level of migration has been reduced and because the proportion of skilled workers among migrants has declined. In support of this claim a comparison was made between the proportion of skilled workers in the Australian population (9.3 per cent of the workforce in 1977) and the declining percentage of skilled workers among migrants (10.6 per cent between 1961 and 1965 to 9.3 per cent during the period 1971 to 1975).

Informally upgraded tradesmen were recognized by the National Training Council as a significant but unquantifiable component of the skilled workforce. A survey in 1969 suggested that up to 26 per cent of fitters and turners and machinists, and 14 per cent of motor mechanics and panel beaters were in this category (National Training Council, 1977b). These results were broadly consistent with a more recent survey conducted by the Australian Bureau of Statistics (1977) which estimated that 86 per cent of people working as tradesmen were qualified, although there were differences between industries, states and between private and public employment. More unqualified tradesmen were employed in private than public enterprises. Small firms were also more likely to employ unqualified tradesmen. A significant disadvantage of this system for the individual is that the upgrading is not necessarily transportable on changing jobs. This is because the upgrading may be for very specific work. It is also noteworthy that upgrading is more prevalent in periods of high employment: a point which suggests that existing training schemes might be inadequate in times of buoyant economic activity. In a limited number of trades upgrading may be formally recognized under the Tradesman's Rights Regulation Act, but the number of people who gain tradesmens certificates in this way is small. Apart from migrants, the number of certificates issued is about 1,400 each year (National Training Council, 1977b).

On these grounds the National Training Council argued that by far the major source of skilled tradesmen is the apprenticeship system. The nature of this system will be discussed in the next section. At this stage the discussion is directed only to statements made about the system as a source of skilled tradesmen.

The National Training Council (1977b:3) estimated that the intake of new apprentices had averaged about 38,000 each year since 1973/74. Of this about 20 per cent of apprentices withdraw from training during their period of apprenticeship. Consequently it estimated the net output of the system at about 30,000 each year. Over the ten-year period from 1967/68 to 1976/77 it would appear that the annual intake of new apprentices has grown from about 28,000 to about 39,000 (Australian Apprenticeship Advisory Committee, 1977). More recent data contained in the report of the Committee of Inquiry into Education and Training (Australia, 1979) noted further increases in the numbers of new apprentices in 1977/78.

Estimates of the requirements for skilled tradesmen appear to be difficult to make because they depend so much on assumptions about factors which are difficult to estimate. Such factors include the level of activity in industry, the rate of retirement of skilled tradesmen, the impact of technological change, and changes in productivity. The question of the extent to which the apprenticeship system appears likely to supply sufficient new tradesmen is further complicated by the nature of statistics about that system. The Committee of Inquiry into Education and Training (Australia, 1979) observed that some of the statistics concerning the numbers of apprentices in training had uncertain bases.

The National Training Council (1977b, 1978b) has argued that the existing apprenticeship system would not produce sufficient skilled tradesmen to completely replace estimated annual losses. That argument assumed an annual loss of four per cent from the existing 'skilled workforce'. A small difference in the assumed rate of loss would affect the conclusions quite substantially. Moreover, in the estimates made by the National Training Council there existed some uncertainty about the pool from which losses were calculated. The skilled labour force is somewhat greater than the number of qualified tradesmen and this creates a problem in estimating the number of new tradesmen required. The Industrial Training Commission of Victoria (1977) has drawn attention to the need to examine the age distribution of the skilled workforce. On the basis that the rate of retirement was likely to increase, that body argued that there was a need to increase the number of tradesmen in training.

Analyses conducted for the Committee of Inquiry into Education and Training (Kinnaird, 1979) were concerned with the issue of whether there were shortages of skilled labour at the present time. Based on surveys conducted by the Department of Employment and Industrial Relations it was concluded that there was not an overall shortage of tradesmen in Australia in 1977 (Kinnairs, 1979:474). In fact there appeared to be rather more unemployed tradesmen than unfilled vacancies. The report suggested that there were structural imbalances in the labour market rather than any general shortage of skilled labour. Hence it would appear that the aggregate numbers of tradesmen and vacancies for tradesmen appear to deny the claims of shortage. However there may be specific shortages in particular occupations, locations or even skill areas within trades (Department of Employment and Industrial Relations, 1978), even though these would appear to be few in number. Part of the reason for differences in the viewpoints outlined above may lie in the nature of the estimates being made. The estimates produced by the National Training Council (1977a) indicate impending rather than actual shortages. Present vacancies could be filled by unqualified tradesmen. In fact actual vacancies may not eventuate even though skilled tradesmen retire. National Training Council estimates assume no reduction in the demand for skilled tradesmen. If the extent of automation in industry has increased then the rate of production of new tradesmen need not be equal to the rate of retirement of existing personnel. The recent Crawford (1979) report on manufacturing industry in Australia has explored the effects of automation in more detail than is possible in the present report. It argued for more extensive retraining schemes to assist people to adjust to changes in the nature of work available.

In spite of the uncertain nature of available employment there does not appear to be any shortage of willing applicants for apprenticeships. Mackay (1977a, 1977b) found in an urban region of Melbourne, and in a rural city, a number of potential apprentices who returned to school, or enrolled in other courses, simply because they could not find employment as apprentices. On a national basis it is acknowledged that there is an excess of applicants over apprenticeship vacancies (National Training Council,1977). In addition there are probably many potential apprentices who at present are ineligible because they are older than 19 years. Where this age restriction does not apply, in the Australian Capital Territory, one in eight of the apprentice intake is over 19. Given that there is no shortage of applicants, the limiting factor would appear to be the capacity of the apprenticeship system, particularly the capacity of industry to provide on-the-job training. Among the several suggestions for resolving this impasse are proposals for complementary variations of apprenticeship which involve providing the first year of the program on a full-time basis in a college.

The National Training Council (1977b) has advocated one such scheme which could reduce the demand on industry for a given output of tradesmen. Under that proposal one third of an intake of apprentices would undertake one year of full-time training followed by two years in industry. The remaining two thirds of an intake would serve a conventional four year apprenticeship. The output from each scheme would be the same but the former would involve about 17 per cent fewer places in industry at any time. If all of an intake followed the new program only half as many places in industry would be occupied as in a conventional apprenticeship. Clearly the ratio of output to demand on training places in industry is higher under the revised scheme. However, it needs to be noted that the total time of training is reduced from four to three years as a result of a more intensive full-time first year. It can be argued that in circumventing the restrictions on the intake of apprentices by the limited capacity of industry, a cost has been shifted from the private to the public sector. This would arise since students would be doing at least the same amount of off-the-job training as previously, but there may be a need for some additional facilities as a result of the larger intake and there would be a need to provide more practical training in the first year.

Such a proposal is not very different from the pre-apprenticeship courses in New South Wales and elsewhere in which students study full-time for one year and subsequently obtain a reduction in the term of their apprenticeship. Pre-apprenticeship courses have been included in the category pre-vocational for the purpose of this report. Accelerated Apprenticeship Training (Griffin, 1978) in Victoria compresses the 'off-the-job' training into the early years of an apprenticeship but does not reduce the total time of the indenture. More importantly pre-apprenticeship courses are undertaken before securing an apprenticeship while Accelerated Apprenticeship Training is a variation in training arrangements after an apprenticeship has been secured. For these reasons Accelerated Apprenticeship has not been considered pre-vocational. A crucial issue in the role of pre-apprenticeship programs, as part of a complementary strategy to increase the capacity of the apprenticeship system is that of the transition from pre-apprenticeship to apprenticeship. It is important to know whether a high proportion of those who complete such programs subsequently gain apprenticeships. If few graduates are able to complete their training the capacity of the system would not have been increased. In brief, the issue is whether the limitation has been reduced or merely shifted to another point.

A more radical approach which has been advanced by some has been to provide a completely full-time program of training in the skilled trades. Such a proposal would enable the output of tradesmen to be based on the estimated needs of industry rather than limited by the capacity of industry to provide training places. It would involve a substantial shift in the cost of training from the private to the public sector, as training would be financed in the same way as for other forms of post-secondary education. The Australian Committee on Technical and Further Education alluded to such a scheme:

> In the light of population and labour force trends and the tendency for youths to gain more education, the gap between the supply of apprentices and the demand for tradesmen is unlikely to be closed by the number of 15-19-year-olds entering apprenticeship unless changes to the system occur more rapidly to suit present social and industrial circumstances. One of the principal changes should be to implement Conclusion (44), whereby youths would be subsidised as students, if they are prepared to study at a technical college full time in the trades areas for a period; this period would be credited as part of the apprenticeship, should they subsequently enter the trades. This would require a conscious policy change. The fiction of the present apprentice-in-industry concept is that apprenticeship training is essentially on the job training, supplemented by attendance at school. The actuality, however, is a mixed system concept in which schooling and job experience are a partnership, that is, are complementary. The mixed system should make provision for an introductory period of education and training off the job for the learning of the basic elements of trades and proper work methods and be followed by periods of training and experience in industry. Changes may be necessary in industrial law to bring about the maximum flexibility in apprentice training arrangements. (ACOTAFE, 1974:1)

Conclusion (44) stated:

> ... The organization of technical college courses should be revised to include a full time option for students who in its absence enter the labour force prematurely and most of whom are not attracted to the tertiary courses available on a full time basis at other institutions. There is no logical reason why the community should not subsidise the vocational education of persons wishing to study for skilled or middle level occupations at a technical college to the same extent as applies to persons seeking a degree or diploma at a university or college of advanced education ... (ACOTAFE, 1974:x/vi)

Full-time pre-vocational education programs were thus seen as precursors to the development of more far reaching full-time training for tradesmen. As such continuing evaluation of these programs is important as a guide for future policy.

An additional aspect of the training of skilled labour is that not all occupational areas are served by the apprenticeship system. Many areas of skill rely for skilled labour on a variety of formal and informal systems. In other areas technological change has placed new demands on training systems. New types of occupations have arisen and the nature of the work performed in existing occupations has altered. Education and training in some modern skills is not necessarily best achieved through apprenticeship. It is unclear how effective existing systems are in training skilled workers at the present time. However, the Organization for Economic Co-operation and Development (1976) considered that there were inadequate opportunities for young people to gain practical training outside the apprenticeship system. This was described as constituting a major problem for the supply of skilled labour in certain areas.

Episodic demand

The second type of manpower demand cited by TAFEC (1977:124) in support of the development of pre-vocational education is episodic demand. This refers to the demand for additional skilled manpower as the economy emerges from a recession. It has already been noted that the key factor governing the output of skilled tradesmen through apprenticeship is the capacity of industry to employ apprentices. In fact the capacity of an industry to employ apprentices depends largely on the level of activity in that sector of the economy. Given a depressed level of activity, as at present, the capacity of industry to train apprentices is reduced. Under these circumstances when there is potential for an expansion of activity in an industry, perhaps arising from changes in economic policy, the response of the industry will be limited by a lack of skilled workers. In turn this inability to respond will prevent any economic stimulus having a general or immediate impact. The problem has been given prominence by the National Training Council (1978a, 1978b) who have argued that such shortages would lead to 'production bottlenecks and new inflationary pressures'. As the Technical and Further Education Commission (1977:124) stated, no changes in the apprenticeship system itself will resolve this problem.

The fact that the extent of training is tied to the level of economic activity is compounded by the duration of the term of indenture. In general, an intake of apprentices will take four years to become qualified as skilled tradesmen. As a consequence any attempt to respond to changed circumstances will not be rapid. Those who argue that the apprenticeship system balances the supply and demand for skilled labour ignore the lag which is inherent in the system. At present there appears to exist a nexus between the provision of training and the level of economic activity.

Pre-vocational education programs have been seen by the Technical and Further Education Commission (1977:125) as having the potential to reduce these problems. It is argued that as a complemenent to conventional apprenticeship such courses would buffer the effects of variations in business activity. Pre-apprenticeship courses provide part of the normal training on a full-time basis so that the number of places available is not dependent on industry. The available places can be increased in advance of a predicted economic recovery. Of course the later parts of the training program would be still dependent on industrial training, though the time lag between increased intakes and increased numbers of trained workers would be rather shorter.

The problem of co-ordinating the output from pre-apprenticeship with the availability of apprenticeship places could be approached in three ways. One would be to attempt a careful prediction of needs and control entry to pre-apprenticeship courses using manpower planning principles. Unfortunately it does not seem that manpower planning is sufficiently accurate to enable this to be attempted with much confidence. A second approach would be to allow the numbers in pre-apprenticeship courses to exceed the predicted apprenticeship places, and perhaps even to be based on social demand. Selection of apprentices would probably be more reliable than if it were done direct from school, and students might be better informed about the nature of the trade. Those entering pre-apprenticeship would need to be made aware of the availability or unavailability of apprenticeships. The Technical and Further Education Commission (1977:125) considers such an approach could be socially justified if the pre-apprenticeship provided young people with a better opportunity to secure employment apart from apprenticeship. Such an approach could also be further justified if the courses were valuable for the personal development of the individual. A third approach would be to extend the pre-vocational courses so as to provide a course of full-time trade training as a general basis for employment in a trade so that training was independent of the level of activity in an industry. The ramifications of this alternative in terms of cost, practical training and social development are very broad and beyond the scope of this report. At this stage it can be noted that the Technical and Further Education Council (1977:125) indicated its support for a careful monitoring of numbers, but allowing some excess, in pre-apprenticeship courses.

Any consideration of the potential role of pre-vocational education in meeting manpower demands depends on assumptions made about those demands. The extent of skill shortages in industry is uncertain. However, if there are shortages it seems that existing methods of training skilled workers are unlikely to overcome them. Full-time training programs are supported by their advocates on the basis that they increase both the capacity and the responsiveness of the training system. They are also seen to provide training in areas of skills which are not served by the apprenticeship system.

The Apprenticeship System

In the discussion of the demand for skilled manpower in Australia, the apprenticeship system was mentioned as the major source of skilled tradesmen. During that discussion, attention was focused on the capacity of the apprenticeship system to train the number of skilled tradesmen required by industry. Some opinions suggested that the future output from the apprenticeship system would be insufficient even if levels of production remained static. In the event of greater demand for goods and services, it was argued that the apprenticeship system would not be able to respond by increasing its output quickly. There remain other aspects of the apprenticeship system which are important to any consideration of the development of pre-vocational education.

The system

Apprenticeship in Australia at present involves industry and technical colleges in a co-operative training venture. Normally the duration of an apprenticeship is four years during which the apprentice works for an employer and attends technical college for part of the time. The apprentice and the employer enter a contract, or an indenture, binding the apprentice to the employer for a prescribed period of time. In return the employer undertakes to teach the apprentice the trade or craft. State apprenticeship authorities are responsible for approving those employers who may employ apprentices and for ensuring that the conditions of the apprenticeship are fulfilled. The content and structure of the trade courses offered are the responsibility of Technical and Further Education Authorities who normally collaborate with trade advisory committees of the apprenticeship authority. Though there is some variation between trades and between states a normal four year apprenticeship would involve an apprentice in about 800 hours attendance at college. Provisions for college attendance also vary between trades and states but commonly involve either 'day release' or 'block release'. A typical day release arrangement would involve a student in eight hours attendance (in one day) at college each week, for 36 weeks over the first three years of the apprenticeship. A typical 'block release' program would involve attendance at college for seven weeks (40 hours each week), in each year, over the first three years of the course. Block release programs are more prevalent in states such as Queensland where transport to day release training would prove difficult. It should be emphasized that this is a much simplified picture of the apprenticeship system in Australia. In fact the system is extremely complex as a consequence of the variety of special requirements of different occupations, the plethora of responsible authorities, and the relations between commonwealth and state industrial awards. A more detailed description is contained in the recently published account of the essential features of Australian Apprenticeship systems (Department of Employment and Industrial Relations, 1977).

Griffin (1978) has described the way in which the present system of apprenticeship training has evolved. It originated in the extended 'on the job' training provided for apprentices by master craftsmen lasting up to nine years. This usually involved the informal transmission of knowledge and skills through a close working relationship. Usually the craftsman provided food and board, together with a small amount of money for the apprentices under his charge. During the nineteenth century as production became more industrialized the training process was restricted to observation, practice, and advice at work (White, 1971). Griffin characterized this shift as being from a personal to a professional bond. He noted that this shift finds its ultimate expression in the full-time training systems of some European countries.

The incorporation of a component of technical schooling was a still more recent development. Griffin (1978) observed that the role of technical schooling has been enlarged from its original purpose of providing instruction in trade theory. Training in practical skills was provided at technical schools because employers had trouble providing suitable practical training on the job. Now employers provide mainly opportunities for practice and refinement of the skills learnt in technical school. In brief, Griffin argued that the trend in the development of apprenticeship training has been towards greater formality involving more direct instruction in technical schools or similar institutions. Ryrie and Weir (1978) noted similar trends in apprenticeship in Great Britain.

In his analysis of apprenticeship Griffin postulated three distinct components: induction, instruction and exposure. The induction component was seen as that time during which the apprentice became oriented to the occupation and the world of work in general. It corresponds to some of the shorter pre-apprenticeship programs, though it has not yet received wide recognition. Formal technical schooling provides the major part of the instruction component during which both trade theory and skills are systematically taught. Finally, Griffin recognized an exposure component during which an apprentice had time and opportunity to refine and develop skills. It was acknowledged that in skilled trades adequate time for this process was very important. Griffin's analysis of the main components of apprentice training is valuable in specifying the essential elements of the process. It enables one to examine the system, and alternatives to it, from a new perspective. Even more importantly it provides a framework around which alternative proposals for training in the skilled trades can be structured.

Evidence supporting apprenticeship

A recent review of national policy on the transition from school to work in Australia concluded that:

> It is our view, based on the evidence we received, that the apprenticeship system has served Australia well and that it should not be swept away unless something better is put in its place.
>
> (OECD, 1977:54)

Part of the appeal of the apprenticeship system is that it provides a form of practical training that is based on actual work experience. Through apprenticeship young people are able to develop vocationally useful skills, and practise those skills under the conditions of real employment. Moreover they enjoy a measure of financial independence, and the valuable experience of working with adults as colleagues. As argued in more detail later in this chapter this is probably as important in the transition from school to work as the acquisition of vocational skills. At this stage it is sufficient to recognize that advocates of the apprenticeship system argue a strong case in terms of the developmental needs of young people. Moreover, the case is supported by some research evidence.

Recent research studies of the entry of young people into adult society (Wright and Headlam, 1976) and of young people at work (ACTU, 1975) have concluded that apprentices and nurses were among the most satisfied 18 year-olds. Wright and Headlam argued that the combination of learning with working and earning provided a valuable contribution toward the formation of personal identity of the young people involved. They gained confidence as they increased in competence and felt useful because they were engaged in real work.

Problems

In spite of this the Organization for Economic Co-operation and Development (1977) noted that the apprenticeship system was under challenge. As some of the difficulties of the apprenticeship system have led to an interest in various types of pre-vocational programs they demand consideration.

One of the problems facing the apprenticeship system has already been discussed at length: the capacity of the system is constrained by the level of activity in industry. An additional consequence of this for some young people is that they may be denied the opportunity to study in a field that interests them because no alternative to apprenticeship exists in some occupations. The present system appears to require young people to obtain a job before they can obtain education in an area.

The capacity of the apprenticeship system as it exists at present, seems to be restricted increasingly by two additional factors: a reluctance on the part of employers to train apprentices, and structural changes in many industries.

The reluctance of employers to train apprentices was ascribed by the OECD (1977:53) to the costs of training. A report by the Commission of Enquiry into Apprenticeship in Queensland commented that:

> there is much evidence of a positive reluctance developing on the part of a significant number of employers to employing and training more than a minimal number of apprentices and in some cases no apprentices at all for the present.
>
> (Anderson, 1976)

The report observed the tendency for some employers to recruit skilled tradesmen who had been trained by other employers or government instrumentalities so as to reduce costs. Most importantly the report expressed the opinion that this attitude was becoming more widespread. The problem had not arisen simply as a result of the present economic recession. A similar enquiry in New South Wales some eight years earlier noted that the costs of training tended to deter employers from taking on apprentices (Beattie, 1968).

Subsidies and rebates to employers who train apprentices have been introduced to reduce the effect of this cost deterrent. In addition to the problem of costs it seems that some employers consider that the lower productivity of new apprentices deters them from taking additional apprentices. They contend that working time must be allowed to teach basic skills to be covered at later stages in their technical courses.

This latter problem of a lack of occupational skills is seen as one to which pre-vocational courses could be directed. Such courses, it is argued, would provide young people with sufficient basic skills to be immediately useful employees and to continue their training as apprentices. Some proponents of this form of training would wish the entire training program to be completed on a full-time basis, thus shifting the cost of training entirely to the public sector.

Structural changes in some industries have resulted in fewer opportunities for apprentice training. For example, in the building and construction industry much work which was once done by general builders is now done by specialist sub-contractors. Consequently there are now fewer builders and building firms able to offer the general training for apprentices in this industry. While some may reach special arrangements with sub-contractors, there has been a general reduction in opportunities for apprenticeship in this industry. The trend in the building industry in New South Wales has been extensively documented (New South Wales Department of Technical Education, 1973b) and is probably true for other states. Even though a change such as this results in fewer opportunities for tradesmen to be employed in general building work it does not mean that they should not be trained in the varied skills of the building industry. To train for just one specific aspect of the industry would limit their future adaptability. Hence the problem which has emerged is that of how to provide such a general training when the industry can offer few suitable places for apprentices.

Not all the problems of the apprenticeship system derive from a lack of places for training in industry. One frequently mentioned problem is that of 'wastage' during and just after completing an apprenticeship. On average about 6,000 indentures were cancelled each year for the past five years. This can be viewed as either one twentieth of all apprentices or about one fifth of each year's new intake. Over the duration of an apprenticeship of four years it seems that about one fifth of a cohort discontinues the apprenticeship. Compared with other forms of post secondary education this is not so large as to warrant alarm. It seems that when providing for young people whose aspirations may change a number of withdrawals from courses should be expected.

Table 2.1 Reasons for Cancellation of Apprenticeship Agreements

Reason	Per cent for each Trade Group							Per cent of all Trade Groups	Total cancellation
	Metal	Electrical	Building	Printing	Vehicle	Food	Other		
Misconduct	9	7	10	2	8	11	6	9	527
Change of Residence	7	5	11	11	6	10	9	8	513
Incapacity	10	9	15	8	13	7	16	12	745
Loss of Interest[a]	46	38	38	55	40	43	39	41	2564
Training Problems[b]	8	20	10	6	5	4	6	9	533
Other[c]	19	21	16	18	28	25	23	21	1320
Total Cancellations	1771	665	1104	126	741	555	1239	100	6201
Per cent of Average New Apprentices over last 3 years	13	13	17	13	26	23	23		18

[a] Includes entry into other occupation of an unsatisfactory work record

[b] Includes lack of aptitude, inability to cope with the technical course, dissatisfaction with training and the inability of the employer to provide work.

[c] Includes financial difficulties

Source: Australian Apprenticeship Advisory Committee (1978)

More detailed information about the cancellations of apprenticeship agreements is shown in Table 2.1. From those data it can be seen that the most common reason cited for cancellation is loss of interest. The inability to cope with the technical course accounts for only nine per cent of cancellations. Improved selection based on tests of ability is therefore unlikely to reduce the total number of cancellations greatly. Greater attention to the 'induction component' of training might enable potential apprentices to be better informed about their own interests and the work which would be required of them so that there are fewer losses to the system through 'loss of interest'. Pre-vocational education programs of various types could be seen as a means of providing a better induction to apprenticeship.

An additional problem confronting the apprenticeship system is that the jobs taken by apprentices as part of their training vary in the quality of the training they provide. Richardson and Clayman (1974) reported that about half of a sample of Fitting and Machining apprentices considered that they had not received systematic on-the-job training. Many apprentices felt let down. In part, the problem arises from the nature of apprenticeship arrangements which often do not allow for sufficient integration of theory and practice. Even though they were generous in their comments about the apprenticeship system, Wright and Headlam (1976) drew attention to the problems of some apprentices in linking their technical training and their job experience. The National Training Council (1977b) notes that such a problem may arise when the technical training is broad based but the job experience is narrow. Some disjunction between training and experience is probably inevitable because apprentices will be employed in so many different jobs. Only in the group training schemes described by Griffin (1978) does it appear possible to avoid this problem. In principle a period of full-time training prior to apprenticeship would provide an opportunity to co-ordinate theory with practice. However, if the apprentices interviewed by Wright and Headlam are typical, the practice opportunities in such a program would need to be similar to those in real work. Evidence from Britain suggests that where there was close contact between a college and the firms which employed the apprentices in its courses the success rate was higher (Venables, 1967). Yet Richardson and Clayman (1975) noted that a significant number of employers of Fitting and Machining apprentices did not perceive an obligation to provide a varied and systematic program of on-the-job training.

It has been claimed that many apprentices leave school with deficiencies in basic mathematical and verbal skills (TAFEC, 1977:42). Raftery (1976) has suggested that such deficiencies are a serious impediment to success in apprenticeship. Another study (Stock, 1976) indicated that while many apprentices needed remedial mathematics and reading instruction they did not score lowly on tests of general ability. Though it could be argued that the development of these skills is the responsibility of the school system, there is an apparent need to develop the basic skills of potential apprentices to a higher level. However, it ought to be possible to identify more precisely the skills needed as prerequisites for apprenticeship in particular trades and develop those at the start of an apprenticeship. Such an activity would have the advantage of being seen as vocationally relevant by the students. There is some evidence that an improvement in basic skills can be obtained by remedial programs which are seen as vocationally relevant (Walker and Robson, 1976). Beeson (1978) has argued that attention should be focused on overcoming specific deficiencies in the background knowledge of beginning TAFE students. He contended that such an approach would be a more effective way of improving the performance of students in their TAFE courses. An important element in this argument is that it would be necessary to identify specific prerequisite knowledge for the program students are to enter. Once important prerequisites have been identified it would be possible to develop teaching and learning strategies to overcome deficiencies in that prerequisite knowledge. An application of this approach to an introductory physics course in some Melbourne TAFE colleges was successful in helping students overcome deficiencies in prerequisite intellectual skills. On this basis it was suggested that the approach had wider applicability (Beeson, 1978:70-75). The application of this approach to training in skilled trades could be included as part of pre-vocational education. It would probably be more effective than remedial programs directed to more general aspects of literacy and numeracy.

The problems mentioned in relation to apprenticeship do not, in general, concern the principles on which the system is based. Rather they concern difficulties involved in sustaining the system mainly in terms of providing suitable employment which involves training. It would seem important that any complementary arrangements to apprenticeship in trade training should recognize those aspects of apprenticeship which seem to provide effective training and satisfaction for the students: adult treatment, financial independence, and realistic work tasks.

Secondary School Curricula

It is well known that the proportion of young people continuing full-time schooling beyond the age at which attendance ceases to be compulsory grew rapidly during the sixties and seventies in most industrialized countries. In Australia in 1964, 38 per cent of 16 year-olds and 17 per cent of 17 year-olds were enrolled full-time in school. By 1972 the figures had risen to 55 and 30 per cent respectively (OECD, 1977:33). Even though the rate of growth has slowed since then, the proportions of 16 and 17 year-olds at school have remained high. Only very recently in some states has there been evidence of a fall in the retention rate of males. Fitzgerald (1971) documented the way in which the rapid growth of upper secondary enrolments in Australia affected the organization and structure of secondary schools. A similar analysis of the analogous changes in Western European countries has been reported by King, Moor and Mundy (1974). In both these analyses attention was focused on the wider range of social backgrounds, attainment levels, interests and aspirations of students now involved in post compulsory education. Secondary schools were obliged to review their traditional curricula.

It was noted by Mackay (1977b) that many potential apprentices who could not find employment returned to school in Year 11. It is possible that other young people who wish to leave school after Year 10 return to school because of the lack of available employment. Some of the more general pre-vocational courses are sometimes supported on the basis that they provide an alternative form of post compulsory education for such people (Queensland Department of Education, 1978a). In support of these courses it is argued that they are most rewarding for students whose interest is not primarily in academic subjects.

One study conducted at the Australian Council for Educational Research (Rosier, 1978) showed that family environment was less strongly associated with the decision to leave school at the compulsory age among Victorian and South Australian students than among their peers in other states. It is interesting that these were the two states which at the time the data were collected operated secondary technical schools. The possibility exists that the curricula of those schools proved attractive to students who would otherwise have left school. Another study by Connell et al. (1975:301) concluded that even though schools covered traditional scholarly disciplines well, some young people found them insufficiently related to the social and vocational requirements of the society. Poole (1978:13) also suggested that many students desired a much closer link between school and work. This evidence does not necessarily suggest that all senior school programs ought to be changed so that they are more practical. Rather it suggests that there is a group of students to whom a more vocationally oriented form of schooling would be attractive.

In its 1976 Review of Educational Policy in Australia, the Organization for Economic Co-operation and Development reported that there was a growing belief that young people would be given a better start in adult life if they sensed personal achievement rather than academic failure (OECD, 1976:18).

This view is reflected in the arguments for a polytechnical pre-vocational program by the Queensland Department of Education (1978). That body argued that an educational program oriented to practical skills would provide encouragement for those whose academic achievement was low and 'better fit them to progress into society as informed and adequately prepared young adults'. Morrison (1973) reviewed a number of studies which supported the view that continued failure resulted in lower levels of self-esteem. Results from her own research were consistent with this general conclusion though she noted each successive failure does not lower self-esteem by an equal amount: some adaptation occurs.

The argument offered for pre-vocational education programs as an alternative form of post compulsory education is one for greater diversity. At present full-time post compulsory education does not include much opportunity for study of skilled trades. It is contended that full-time study in this area may provide an important alternative means for the general education of a significant group of young people.

The Transition from School to Work

The three aspects of the rationale for pre-vocational education discussed so far have concerned specific problems to which pre-vocational education has been seen to provide solutions. It remains to discuss the more general issue of the transition from school to work.

A recent report by the Technical and Further Education Commission considered that pre-vocational education programs in Technical and Further Education could assist some young people make a successful transition from school to work (TAFEC, 1977:125). This aspect of the program certainly evokes wide interest: an interest which seems to have been stimulated by the increased levels of youth unemployment.

Problems associated with young people in Australia leaving school to start work have been the subject of reports by the Commonwealth Department of Education (1976a) and the Organization for Economic Co-operation and Development (1977). Yet it should be emphasized that the issue of a successful transition from school to work involves more than obtaining a job. The problems involved in the transition from school to work are in part the problems of adjustment to adult life. In leaving secondary school a young person is moving from a sheltered environment to one which presents new requirements. At the simplest level these requirements involve longer hours and unfamiliar procedures. More profoundly they involve adapting to a role in an organization, working with people of a wide range or ages, becoming familiar with the values and behaviour of the employer and fellow employees, being expected to work without constant supervision, being held responsible for one's action and experiencing punishment in other than a personal sense. The problems of leaving school and starting work seem especially great for those young people who embark on this transition before they are psychologically and socially equipped for work. Because work looms large in community expectations of adult life, problems encountered in this transition seem likely to have far reaching repercussions on the personal development of young people.

A problem in discussing the transition from school to work is that important terms are seldom defined. What is meant by a successful transition is a particularly ephemeral notion. The simplest criterion might be whether or not a young person obtained a job on leaving school. Beyond that might be added a measure of whether the job obtained was commensurate with the person's skill. These two criteria correspond to the notions of unemployment and under-employment. Lewis (1976) in a study of success in transition of Year 12 students in Australia, added the complementary criterion of whether a young person retained a job, i.e. job stability. In the present study a consideration of satisfaction in the work environment has been proposed as a further criterion in examining the transition from school to work. In brief, an analysis of the transition from school involves unemployment, under-employment, job stability, and job satisfaction.

Formal educational programs are limited in several ways from assisting young people make the transition from school to work.

Firstly, it would appear most unlikely that any educational program could have a general impact on the level of youth unemployment. Even when applauding the development of the type of pre-vocational program considered in this study a recent report cautioned:

> Such courses are not a panacea for all the problems of youth unemployment, for example, they can do nothing to overcome a general lack of employment opportunities due to the level of economic activity. What they should do, however, is to improve the motivation, skills, learning techniques and self-esteem of people who might otherwise be unemployed; assist in training people in areas of skill shortage where jobs are available; and provide an investment in improved productivity against the time when the economy picks up.
>
> (TAFEC, 1977:150)

It is possible that some programs may act as job creation schemes. One means by which this could happen is that novel and valuable skills might be developed, so that new types of job are created where none previously existed. Another possibility is that the graduates of some programs might be so impressive that the employers hire them in addition to their normal staff. Neither of these means of job creation seem very likely. Another possible means by which pre-vocational programs might have some impact on youth unemployment is by developing skills in occupational areas where there is a shortage of skilled labour. However, as argued earlier, even if there are some specific areas of skill shortages, filling those positions would only have a slight impact on the general level of youth employment.

Secondly, given that a successful transition from school to work involves more than obtaining a job, the development of new educational programs attacks only one part of the problem. The other part of the problem is the nature and structure of work. Wirtz (1977) has argued strongly that to facilitate the transition from school to work requires more than better vocational programs. Changes in working conditions which result in a more satisfying working life are equally important. It is a theme which is now being mentioned frequently in the literature on school to work transition (Mills, 1977; Husén, 1975; Thorsrud, 1977) and merits serious consideration. At the very least it ought to caution us against expecting too much from new educational programs.

A final possible limitation on the effectiveness of new programs in coping with the transition from school to work is that of the institutional framework in which they are conducted. The future of institutional schooling for adolescents of age greater than about 16, has recently come under careful scrutiny (Bulcock, 1976; Husén and Bulcock, 1976) with a view to utilizing other agencies for initiating young people into adult life. In part this proposition has arisen because the conditions of senior secondary schools do not provide sufficient similarities with the world of work. The programs considered in this study have attempted to overcome these difficulties in a variety of ways and provide interesting innovations in this area.

Even though these limitations need to be acknowledged, it should not be inferred that there is no place for pre-vocational education in the transition from school to work. It is worth considering the means by which such programs might be expected to have an impact in this area. O'Toole (1977) has identified the major goals of career education in the United States which appear to be similar to the goals of pre-vocational programs in Australia.

1 The provision of skills;

2 The development of appropriate attitudes;

3 The provision of information about careers.

Some of the problems associated with the expectation that providing skills will ease youth unemployment have been mentioned earlier in this report. In brief, such an expectation appears to be based on an assumption that underlying youth unemployment is a shortage of skills. Nor is the assumption that increasingly high levels of skill are required in the labour market easy to sustain (Berg, 1973). It would seem that the acquisition of new skills might affect at best, the relative position of an individual in the job queue. In any event the employment record of graduates of vocational courses in the United States aimed at skill development, is not better than that of graduates of general courses (O'Toole, 1977). It seems that in the United States many employers do not demand school graduates with specific skills but would rather provide training themselves (O'Toole, 1977). The same comments are possibly true of Australian employers.

Any consideration of the provision of skills needs to take into account the degree of job mobility in modern industrial societies. One recent analysis (Pratzner, 1978) argued that because of the degree of job mobility vocational education programs should be directed to occupational adaptability and transferable skills. Vocational educational programs, it was argued, should prepare not only for a job but for work careers characterized by change. The problem encountered by Pratzner (1978) was in identifying transferable skills. While there was consensus about a number of broad categories there did not appear to be a single agreed list of skills applicable across a broad range of settings. Faced with this problem Pratzner (1978) argued that because all skills were potentially transferable, the process of transfer was of paramount importance. He contended that the idea of teaching for transfer should explicitly permeate a whole program and should be supported by providing students with the opportunity to practise and use their skills and knowledge under a wide variety of conditions.

Viewed in this light the provision of transferable occupational skills through pre-vocational programs is an important issue. Skills developed with this objective in mind would aim to provide a person with the capacity to do a great many things not necessarily related to their immediate employment. As one example the skills of carpentry are not wasted on a person who does not become a carpenter. They may provide a valuable and satisfying basis for many other activities. This conception of the skills which ought to be provided through pre-vocational programs involves a broader vision of the role of those programs. It sees them as directed towards the transition from youth to adult life rather than from school to work. Practical skills are seen as related to a range of possible occupations and leisure time activities. Consequently vocational courses may be directly related to the student's continuing personal development.

The development of appropriate attitudes to work is another way in which it is claimed that formal programs of vocational education may assist in the transition from school to work. Some evidence presented by O'Toole (1977) suggests that attitudes to work are important factors in obtaining or retaining a job. Such a view is consistent with the claim by Edgley (1977) that when employers talk of a lack of skills among young employees they mean a lack of what they consider to be appropriate attitudes. In spite of this, attitude development is probably the most controversial aspect of vocational education.

Some critics of vocational education claim that what is intended is to develop compliant and submissive attitudes among young workers (Edgley, 1977). It is argued that by such means employers will have tighter control and employees will be more willing to tolerate boring and repetitive jobs. Other critics have concentrated on the limited development of a further group of attitudes. O'Toole contends that through an emphasis on the development of skills students are not encouraged to think about broader social issues. In this way they are ill-prepared for participative citizenship. It is this aspect of vocational programs that seem to have prompted Wirth (1977) and Bledstein (1977) to support developments in which there is a fusion of liberal and vocational education.

It would appear that the challenge involved in this aspect of vocational education is to define what attitudes, if any, should be developed, and how best to develop them. As an initial contribution to this challenge we would suggest that a distinction be made between attitudes to work and attitudes to employment. There may be important attitudes towards the satisfaction of completing a piece of work thoroughly which are not dependent on being either compliant or rebellious towards an employer. A commitment to good work seems to be one important attitude to work which does not necessarily depend upon acceptance of an existing social structure. Other aspects of attitudes to work which can be considered in this context are vocational maturity and occupational identity. These are discussed in more detail later in this section. As a second contribution to this challenge we would argue that an important part of preparation for work is to understand the social-industrial structure which one enters. If such an element is not consciously included in vocational courses there is the risk of developing the attitude that anything which does not involve technical skills is unimportant. It is in this respect that curriculum developments which involve a fusion of liberal and vocational education are crucial. Watson (1973) has identified a number of issues involved in providing liberal studies within vocational programs and described alternative means for achieving this. What is needed is to provide liberal studies which are directly relevant to particular vocational programs. Students are then better placed to relate the various aspects of their course.

In brief, we recognize that the attitude component of pre-vocational education needs careful consideration. We argue for a separation of attitudes to work from attitudes to employment, and for the provision of sufficient information about social-industrial structures to enable individuals to form their attitudes to employment on a rational basis. Understanding the social-industrial structures involved in employment is probably important for graduates of pre-vocational courses in view of their need to adapt to the requirements of a first job. However, it seems necessary to assert that to provide information about employment roles so that an individual may adapt behaviour ought not necessarily involve an encouragement of passive acceptance of an existing structure.

We do not pretend that the attitudes to work we have proposed are value free. However, we do contend that the values are more general and not dependent on a particular view of the roles of employers and employees. One attitude to work which we have considered is that of occupational identity: the extent to which students come to regard themselves as workers (Musgrove, 1967). Another important dimension is that of Vocational Maturity, which incorporates the notion of a preference for, and an ability to, make rational choices about work and careers (Crites, 1969). One study which examined the vocational maturity of students undergoing a course of vocational training yielded some interesting results (Purcel et al., 1972). Using the Attitude Scale of the Career Maturity Inventory as the criterion it found differential effects of vocational training. Students of technical programs showed gains on the criterion while students of clerical programs showed declines. In addition it was found that the gains of the former group were about the same as the gains of their peers who started work directly. A further illustration of the types of attitude envisaged as an attitude to work, rather than an attitude to employment, is that of need for achievement. Bachman et al. (1967) studied the need for achievement through work as part of the Youth in Transition Project. The scale which was used was more directly related to the world of work than many measures of need for achievement. It did not simply assess 'ambition' but rather the extent to which an individual desired to achieve satisfaction through work: an important aspect of pre-vocational education.

The third area in which full-time pre-vocational education might assist in the transition from school to work is in the provision of a broad knowledge of possible career opportunities. More adequate career information clearly cannot reduce youth employment though it could possibly reduce the duration of unemployment by providing the capacity for more effective job seeking. It can also ameliorate some of the problems of perceived underemployment by enabling students to form realistic expectations of jobs. The sort of information which can be provided is of two types. Firstly, young people can be helped to discover their own interests and abilities. Secondly, the requirements of a range of jobs can be made known to them. Over and above this they can learn how best to adapt their interests and abilities to the sorts of jobs which might be available. The importance of providing career information is recognized in career education programs in secondary schools and in Link programs in Technical and Further Education (Blakers, 1978). Full-time pre-vocational programs are able to provide more detailed information about careers in a more limited field. They aim to enable a student to discover his capacity for work in that field.

A most important way in which pre-vocational education programs might assist in the development of each of these three outcomes and hence in the transition from school to work is through the provision of work-related tasks in a simulated work environment. In this respect the program could provide two important bridges between school and adult life. Firstly, it might provide a gradual introduction to a working environment: an introduction during which the penalty for failure is less severe and in which guidance can be offered. Students can become accustomed to longer hours of work and the different types of restriction and freedom which an adult worker encounters. They can also learn the standards of workmanship which are expected of them. More importantly in technical college courses they might learn informally from teachers who have some experience of industry about aspects of working life not easily incorporated into a formal curriculum.

Secondly, this type of experience can have a much broader value in the transition from youth to adulthood. Erikson (1968) has argued that work experience during adolescence is valuable in identity formation.[1] Many young people are now denied such an opportunity because of the shortage of jobs and the pressure to remain at secondary school. The provision of such experience in a supportive environment holds the possibility of rectifying this deficiency. Coleman _et al_. (1973) reinforce this view referring to the exploratory period in which young people examine jobs and careers in terms of their interests, abilities and values and the requirements of work. As Coleman _et al_. (1973:158) argue the aim of such an exercise should not be primarily 'to learn a skill but to give experience in responsible interdependent activity'. There is evidence that the more similar such experience is to real work the more effective it is in facilitating the transition from youth to adulthood (Shore, 1971).

Coleman _et al_. (1973:142) argue that it is difficult to provide such experience in schools. They contend that in school a student is dependent and the school is responsible for shepherding his development, yet if the student is to develop, he needs to be given the responsibility for making decisions. To reorganize a school so that young people have responsibility and authority, they argue, is incompatible with the basic custodial function of a school. Furthermore, it is argued by Coleman _et al_. that an important part of the maturation of youth involves working with people of different ages. In schools, students work with others of similar age under the direction of an older person.

If this argument is valid then this sort of experience is best provided outside schools in real jobs. One response to this is the development of work experience programs of various types in secondary schools (Blakers, 1978). Most of these involve relatively short periods of working in jobs arranged by the school. These periods of work are probably valuable in learning what a particular job is like and in gaining some experience of the conventions of working life. However, limited research in the United States has suggested that the impact of such programs depends very much on how well they are planned and the types of job made available (Stakleton and Magisos, 1975). In some cases Freedman (1963) found that having a job tended to make students impatient with the demands of the school setting. Full-time pre-vocational education programs of the type considered in this report offer an alternative approach to providing this type of experience if in these programs the conditions of the learning environment are made as similar as possible to a working environment. Tasks would be made similar to real jobs, and in a few cases be real construction jobs. Moreover the instructors would need to be people with experience of working in the field in which they teach. Of course, the tasks can never be real tasks in the true sense, their instructors cannot completely discard their pastoral role, nor can the program provide the opportunity to work with people of different ages. To acknowledge these problems is to recognize the difficulties in providing a surrogate for the world of work. Short work experience programs face other difficulties such as the unavailability of sufficient suitable jobs and the tension experienced on return to school. In the present economic climate it seems unlikely that real work experience of sufficient duration could be provided on a widespread basis. Yet the issue is so crucial that it seems worth exploring alternative means by which young people might gain some of the experience of entering work.

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[1] Erikson has written extensively on the term identity. He sees adolescence as a period of identity formation during which an individual comes to know himself in relation to his own capacities and the environment in which he is placed.

Throughout this discussion it has been stressed that the transition from school to work should be seen as but one component of the transition from youth to adulthood. For this reason it has been argued that the criteria for a successful transition should be broader than the obtaining of a job. They should include retaining a job which utilizes an individual's capacity, and the satisfaction experienced in adapting to a new environment. Such a view enables the role of pre-vocational education in this transition to be examined from a broader perspective than whether students obtain jobs: a criterion which is dependent on so many factors outside the course.

In Summary

Pre-vocational education has been advanced by various groups as a potential solution to a variety of problems: manpower demands, deficiencies in apprenticeship training and senior school curricula and the transition from school to work. Since many of these problems have elements in common, the major themes in the arguments for pre-vocational education are interrelated. Even though many of the problem areas discussed in this chapter are interrelated, they provide an indication of the environment in which the new courses were introduced.

From the discussion of pre-vocational education in relation to these problem areas, it is possible to abstract three underlying arguments for its development. For our purposes these adequately sum up the rationale advanced for pre-vocational education by its supporters.

One type of argument could be described as organizational/economic. This argument has considered the effectiveness of pre-vocational education mainly in terms of the capacity and responsiveness of the training system. In brief, pre-vocational education has been supported as a means of providing skilled training, which takes account of structural change in industry and which shifts training costs from the private to the public sector. With respect to this argument it needs to be noted that some dispute exists concerning estimates of the demand for skilled labour. This argument has not generally considered the effectiveness of pre-vocational education in the development of occupational skills.

A second type of argument has concerned the effectiveness of pre-vocational education in terms of the development of occupational skills. This type of argument could be described as occupational-educational. It has been manifest in concern over the nature and breadth of training provided in industry as part of apprenticeship, and in concern at the level of introductory skills which young people possess at the commencement of their term of apprenticeship. It has been evident also in discussion about trade training in occupations not served by the apprenticeship system.

Finally, the third type of argument has involved the broader development of individuals. It has been concerned with more general educational objectives which are equally important in adapting to work and general living as an adult. This type of argument could be described as a general educational argument. From the viewpoint of this argument the development of useful skills, and the provision of valuable experience in pre-vocational education, is directed toward an individual's personal development and maturity. In these terms pre-vocational education has been seen as an alternative to other forms of post-compulsory education which would suit some young people. Most importantly it has been seen as a form of post-compulsory education which would assist in the transition from school to adult life.

A number of possible research issues are raised by each of these three types of argument. The present study has been concerned with developing an approach to the evaluation of educational aspects of programs of pre-vocational education. In particular it has concentrated on those issues important to the development of curricula suited to programs of pre-vocational education. That seemed to be the issue most relevant to state authorities and colleges in the conduct of such programs.

CHAPTER 3

FOUR PROGRAMS

At the beginning of the previous chapter four types of program which were considered to be pre-vocational were specified.

1 Pre-apprenticeship programs intended to lead directly to an apprenticeship in a particular trade.

2 Programs intended to provide work preparation in areas for which training has not been provided in the apprenticeship system.

3 Polytechnical programs designed to provide an introduction to a range of trades with some specialization later in the course.

4 Courses of full-time study intended to lead to a combination of work and further part-time study other than through apprenticeship.

The present chapter contains a brief description of the essential features of one program from each of these categories. It is worth repeating the comment from Chapter One that while these programs incorporate important features of the newer pre-vocational programs they are not necessarily typical of the full range of programs in the area.

Pre-Apprenticeship in Carpentry and Joinery

The general context

During the early seventies the New South Wales Department of Technical and Further Education introduced a series of 'pre-employment trade courses' whereby students attended a program of full time instruction in one or more trades prior to entering an apprenticeship. These were originally described as pre-employment trade courses to differentiate them from a previous system of pre-apprenticeship courses. In practice the new courses were in accord with the definition of pre-apprenticeship training adopted by the Australian Apprenticeship Advisory Committee:

> Pre-apprenticeship (or pre-employment) is a training system in which trainees, normally school leavers, study full-time at technical training institutes for periods usually ranging from 18 weeks to 42 weeks before formally entering into an apprenticeship under special conditions.
>
> (Australian Apprenticeship Advisory Committee, 1976)

From 1978 onwards the pre-employment trade courses in New South Wales have been designated pre-apprenticeship. This new terminology will be used in the present report henceforth.

In its stated rationale for the establishment of these courses the New South Wales Department of Technical and Further Education mentioned many of the points discussed in Chapter Two. Specifically mentioned were the need 'to increase the range in the possible avenues of education open to students of the 16 plus age groups' and the belief 'that the training need is not being adequately met by the established apprenticeship system' (New South Wales Department of Technical and Further Education, 1975:4).

The range of trades embraced by these courses is broad, though the number of students in each program is relatively small compared to those in apprenticeship. In 1977 there were 1,528 enrolled in the various pre-apprenticeship courses in New South Wales, while there were about 51,000 apprentices of whom about 11,000 were new apprentices. However it can be seen from Table 3.1 that enrolments in pre-apprenticeship courses have grown at a more rapid rate than new apprenticeships. Heller and Naylor (1978) have documented the way pre-apprenticeship enrolments are divided amongst the different trades. These data have been recorded in Table 3.2. It can be seen that carpentry and joinery had the largest enrolment of the pre-apprenticeship courses in 1977.

In 1978 there were 348 pre-apprenticeship carpentry and joinery students compared to 3,265 day release apprenticeship students. Of the pre-apprenticeship students 125 were in metropolitan centres and 223 were in country centres. The ratio of pre-apprenticeship to apprenticeship carpentry and joinery students in the country was approximately double that in the city.

Course aims

Five general aims were specified for the pre-apprenticeship course in carpentry and joinery in 1973. The listed aims were concerned mainly with the development of vocational skills and knowledge. However there was mention of 'practical and related instruction', 'an appreciation of on-site procedures and organization' and an intention to develop a degree of personal responsibility in students.

1 To provide the student with both sufficient technical education and off-the-job training to enable him to commence employment with some of the usable skills of a carpenter and joiner and at an advanced stage of his apprenticeship.

Table 3.1 Pre-Apprenticeship and Apprenticeship Enrolments in New South Wales

Year	Pre-Apprenticeship[a]	New Apprenticeship	Total Apprenticeship[b]
1973	263	11 160	42 221
1974	474	12 566	46 097
1975	691	13 189	50 067
1976	903	11 595	50 588
1977	1 528	10 873	51 317

[a] Prior to 1978 these were known as pre-employment trade courses

[b] Derived from figures published by the Australian Apprenticeship Advisory Committee

2. To bring the student to a level of skill sufficient to enable him to enter the industry as an economic asset to his employer; it is intended that the employer could be a cottage builder or commercial/industrial builder or a joiner or a shop and office fitter or any of the other categories who employ carpenters and joiners.
3. To provide practical and related instruction in all stages of the construction of a single storey, timber framed, pitched roof building to be erected as either a demountable or fixed building.
4. To give an appreciation of on-site procedures and organization.
5. To encourage the student to be the responsible master of his own thought and actions, both on and off the job, by developing in him a perspective of his role in the industry and a disposition to look for and gain from new learning situations. The subjects 'Life Oriented Studies' and 'Communications and Self Expression' have been designed to orientate the course towards achieving this end.

(New South Wales Department of Technical and Further Education 1973a).

Course structure

An essential feature of the pre-apprenticeship course in carpentry and joinery was that it was structured around a major work experience activity. At least half the time of the course was spent in constructing a house which was subsequently sold to the Housing Commission. Each class in a college consisted of 16 students, but the construction was performed by groups of eight students working with an instructor. By this means it was planned to provide for the development of practical skills in a realistic working environment. As far as possible the work at the construction site was planned to resemble as closely as possible the working conditions a young person in employment would

Table 3.2 Distribution of Pre-Apprenticeship Enrolments Among Various (NSW) Courses - 1977

Course	Enrolments
Bricklaying	89
Carpentry and Joinery	314
Woodworking Machinery	9
Furnishing Trades	13
Signwriting	13
Painting, Decorating & Signwriting	12
Floor & Wall Tiling	14
Painting & Decorating	30
F & M Welding	119
Metal Fabrication	74
Refrigeration Mechanics	15
Welding	36
F & M	95
Auto/Welding	148
Butchery	39
Commercial Cookery	12
Bakery	11
Electrical/F & M	55
Electrical Trades	72
Radio	15
Plumbing	24
Hairdressing	50
Auto/F & M	76
Auto Engineering	109
Panelbeating/Vehicle Painting	42
Panelbeating	42
Total	1528

Source: Heller and Naylor (1978)

experience. The remainder of each student's time was spent in theory closely related to the construction tasks which were being done at that time on the building site.

In the preamble to the 1973 syllabus it was stated that the course proposed was highly flexible and offered 'a unique opportunity for teachers to develop the concept of integrated teaching' (New South Wales Department of TAFE, 1973a). The syllabus document suggested dividing the program into two strands: one based on the theory, drawing, geometry and calculations and the other on the workshop and site practice. Furthermore it suggested ways of inter-relating the two strands. A revised syllabus introduced in 1977 for both apprentices and pre-apprentices provided for further integration of the subjects covering trade theory, trade calculations and trade drawing around 24 major items (e.g. roofing). In the 12 month pre-apprenticeship course students were expected to complete Stages I and II of the apprenticeship technical education course (i.e. the first two years of CN106) which included 17 of 24 topics. The topic organization and the flexibility also enabled the theory to be closely co-ordinated with the students' activities in the site work of the construction project.

A further important feature of the program was that 'Life Oriented Studies', the liberal education component of the program, was able to be taken by one of the carpentry instructors. 'Life Oriented Studies' has an open curriculum in which individual teachers, and their students, choose the specific topics to be studied over five themes: the work of the trade, the structure of the workforce, leisure and non-vocational activities, common negotiations and social requirements. Given an open curriculum in this component it was possible for some integration between liberal and vocational studies to be realized. The content of these studies could be related to the industry in which the students would subsequently be employed. Even though this arrangement did not apply to Communications, it enabled a coherent structure to be developed for the whole program.

The flexibility in timetabling which was mentioned is in part necessitated by requirements of on-site construction which could be affected by such things as supplies of materials or bad weather. However some indication of the allocation of priorities can be gleaned from the schedule in Table 3.3.

Table 3.3 Allocation of Time in the Pre-Apprenticeship Carpentry and Joinery Program

Subject	Hours per week
Theory/Drawing and Plan Interpretation	7
Workshop/Site Theory and Trade Practice	20
Trade Calculations	2
Life Oriented Studies	4
Communications and Self-Expression-1900D	2
Total	35

Note: This is based on 35 hours per week for 36 weeks.

Relationship to further courses of study

It is intended that students after finishing this course should complete their training through a normal apprenticeship. Exemptions from certain of the terms of apprenticeship have been arranged by the inclusion of a clause in the apprenticeship award. It is possible for a party to apply to the Apprenticeship Committee for credit less than, or in excess of, the prescribed credit.

The situation is further complicated in the case of students who have not been successful in all their final examinations, where individual negotiations occur, and for apprentices employed under Federal awards.

Notwithstanding these complications successful completion of the 36 week pre-apprenticeship course in carpentry and joinery entitled a student to 18 months credit from the term of the apprenticeship. He would be paid at second year rates for the first six months followed by two years at third and fourth year rates respectively. In addition he would have only to complete Stage III of the technical education course on a day release basis. It was believed by many people we spoke to that the length of credit available was a deterrent to the employment of graduates of these courses. Putt (1978) has reported in more detail on the actual exemptions obtained by pre-apprenticeship graduates.

A new development

At the commencement of 1978 a 54 week, or 18 month, pre-apprenticeship program in carpentry and joinery was introduced on a pilot basis. This began in two ways. One was the provision of a six month extension for students who had completed the 12 month course and had not been able to obtain employment while the other was the provision of 54 week programs for some beginning students. In such a program students were expected to complete the final stage (Stage III) of a technical course. The structure of site experience and instruction was similar to that in the 36 week program. Successful completion of this program was intended to entitle a student to 21 months remission from the term of apprenticeship. It is interesting to note that this development was in response to a proposal from the Master Builders Association to introduce complete full-time training for all building trades as a complement to the traditional apprenticeship system.

An Office Training Program

The general context

Courses intended to prepare young people for employment in offices have traditionally been conducted by a number of agencies: technical colleges, private business colleges, and some streams of secondary schools. In general, these courses are intended to lead directly to employment in office work. Even though it may be possible to undertake more advanced studies in secretarial practice, the courses with which this project is concerned are not primarily intended to be preparatory to those studies. There is no necessity to undertake further studies to complete basic qualifications in the occupation as was the case in the carpentry and joinery program discussed previously.

In 1978 the Technical Education Branch of the Queensland Department of Education offered three pre-employment programs in this general area. Two were of six months duration. One of these was a 19 week course for training clerical assistants which required no special conditions for entry. The second was a 19 week course known as Office Training A, which required for entry the achievement in the Junior School Certificate of at least three points in English, 4 points in typewriting and a shorthand standard of 70 words per minute. A third course in this area was Office Training B, which was of 12 months duration and required no special entry standards. In fact it is intended that students completing Office Training B should achieve a similar standard to those completing Office Training A. An indication of the relative importance of these programs can be gained from 1976 enrolment figures which show 995 students in Office Training B, 405 students in Office Training A, and only 11 students in the Clerical Assistant Program.

Office Training B was offered at three metropolitan and eight non-metropolitan colleges in 1978. Even though the syllabus was similar at each college, there were important differences in course structure and teaching methods. In the present investigation, attention has been focused on the course in operation in one college which incorporates a number of important new features. The new features were sufficiently important to consider the program at the college as a distinct entity.

The new program began in the latter part of 1976 admitting students who had partly completed the course at other colleges. It was staffed with teachers from those colleges who were enthusiastic about and volunteered to participate in the new program. In 1977 the first group to undertake the whole of Office Training B under the new program was admitted.

Course aims

In describing the program there were two sets of aims or objectives to be considered. One set came from the syllabus document for the Office Training B. While described as objectives in that document (Queensland Department of Education, 1976) the statements listed simply described the course in general terms:

1 This course is designed to provide skills in secretarial procedures and to develop the personal attributes necessary for persons wishing to pursue secretarial careers.

2 The course allows specialization in either stenographic skills or typing and clerical skills.

A more explicit statement of aims and objectives was contained in the curriculum documents of the particular program under review. The three aims were concerned with broad social and personal aspects of the programs.

1 To provide all students with education which will make them responsible, competent and employable citizens.

2 To provide a situation where students can interact through a program which is flexible and which simulates an office environmnet.

3 To provide an atmosphere of learning which will contribute to their total development as people.

(Queensland Department of Education, 1977)

The nine objectives which were listed were mixed. Some concerned the processes which were to be used in this program (e.g. allow for a variety of experiences, provide individualized instruction) while others concerned the objectives of the program with regard to student outcomes. Taken as a group, while the objectives are mixed, they do provide an indication of the intentions of those who framed the program.

1 To instruct students in shorthand, typewriting, office machines, English, secretarial practice and social training.

2 To enable students to attain a high degree of proficiency in the office skills undertaken by them.

3 To enable students to accept that secretarial practice, English and office machines are part of the total office concept and not isolated subjects.

4 To provide contact with the business world through excursions, guest speakers and work experience.

5 To provide a course of study which allows for a variety of experiences, instruction, practice, re-enforcement, recapitulation and evaluation.

6 To provide an atmosphere where students learn to work with one another; to assist one another; to work on their own.

7 To provide a program of individualized instruction which will enable students to progress according to their potential, and also incorporating remedial and/or advanced instruction.

8 To encourage student initiative, responsibility and sound working habits.

9 To develop student awareness of the community and the economy.

As a result of interviews with those involved in developing the new program, it was apparent that paramount among their objectives was to enable students to be ready for employment. Readiness for employment was taken to include not only the development of necessary skills but also the student's general approach to working in an office environment.

Course structure

As previously indicated, the course provided for two alternative strands, one involving stenographic studies and another involving typing and clerical skills. Students were able to choose the first alternative only if their performance on an aptitude test was satisfactory. The formal structure of each strand is shown in Table 3.4.

In the original curriculum document being considered for the program, there were four key elements in the teaching of that program:

Table 3.4 Formal Structure of Office Training B

Alternative 1		Alternative 2	
Subject	Hours per week	Subject	Hours per week
Commercial English	4	Commercial English	6
Secretarial Practice	4	Secretarial Practice	5
Typewriting	7	Typewriting	10
Social Training	1	Social Training	1
Business Machines	2	Business Machines	4
Shorthand	10	Receptionist Practice	1
Private Study	2	Oral Communication	1
		Private Study	2

1 Authentic practical application,

2 Individual progression,

3 Integrated subject work,

4 Building and reinforcing a basic core of knowledge.

A major feature of the first key element was an attempt to simulate a modern office environment. Two floors of a modern office building were leased and set out as modern open plan offices. Even though the course was conducted in a centre which was administratively part of a technical college it had a separate physical identity. Also important was the equipment provided which was as similar as possible to that found in modern offices. In addition, the tasks which students performed were designed to replicate the tasks which would be expected of them in employment. As part of the year's work, each student assembled an employment folder of samples of their work to present at an employment interview. Organizational matters were handled as might be expected in a modern office. Hours of work were set to match those of employment, reporting of absences were as for a person at work, and the general atmosphere was that of young people at work.

The second key element, that of individual progression, involved the extensive use of self paced learning strategies with cassette tapes, work sheets, and mastery tests. This approach to teaching was an important complement to the provision of simulated work experience. In some ways the instructor was able to function as an office supervisor in each lesson, correcting and advising students who came forward with questions rather than directly teaching. This approach was generally adopted within the framework of discrete one hour lessons, but the extent of using individual materials was considerable. Of course, the development of some skills such as typing at a satisfactory speed was achieved through group exercises.

The remaining two elements, integration and reinforcement of core knowledge, were partly the result of the teaching arrangements. An important part of this was the fact that all the teachers were committed only to this program and could co-ordinate their activities. The program operated on two separate floors each of which had its own group of teachers and one co-ordinator. As a consequence, there was good opportunity for communication between the teachers. In addition, the work in each subject was structured to provide integration and reinforcement. Tasks in English would also involve typing and those in secretarial practice would require both good expression and good typing.

By way of conclusion, it is worth reiterating that the aim of the program was to prepare young people for office employment and to use individual instructional materials. Consistent with this, many students left when they had mastered the work to an appropriate standard. They were not obliged to remain for the rest of the year.

A Polytechnical Program

The general context

When the Australian Apprenticeship Advisory Committee received a report of a working party on pre-apprenticeship training in 1976, it was noted such courses had not been provided in Queensland, Tasmania or the ACT (AAAC, 1976). In Queensland, there had been a pre-apprenticeship course in bricklaying for 56 students which lasted for 20 weeks in 1974 (Hutchison, 1978). Subsequent to a meeting of State and Commonwealth Ministers for Labour in 1976, a series of pre-apprenticeship courses were commenced in 1977. Details have been recorded in Table 3.5. These programs were financially supported by the Commonwealth Government (Hutchison, 1978:50-53) and participants were eligible for allowances under the NEAT system or the Tertiary Education Assistance Scheme.

In addition in 1977 a full-time program for school leavers who wished to subsequently enter apprenticeship, or become skilled workers in trade areas, was started by the Queensland TAFE authorities. This program was known as the Pre-Vocational (Trade-Based) Course. We have used the term 'pre-vocational'

Table 3.5 Pre-Apprenticeship Courses in Queensland 1977

Trade Area	Duration (weeks)	Enrolment	Reduction in Apprenticeship(months)	Stages in App.course completed
Signwriting/Screen-processing	14	14	12	1/2
Refrigeration Mechanics	21	14	12	1 and 2/3
Cabinetmaking	21	28	6	1 and 2/3
Carpentry and Joinery	21	28	12	1 and 2/3
Bricklaying	14	28	12	1/2

Source: Hutchinson (1978:53)

in a generic sense throughout this report. To avoid confusion, this particular program has been referred to as the polytechnical program since it encompasses a number of trades. In this respect, it could be seen as a response to a statement made in the report of the Australian Apprenticeship Advisory Committee 'that future development might include pre-vocational training providing a general introduction to a family of trades' (AAAC, 1976:46).

The polytechnical program was offered in one metropolitan and two country colleges and extended over 35 weeks in both 1977 and 1978.[1] Total enrolments in the program were 224 in 1977, 112 being at the metropolitan college. In 1978 the enrolments were similar. Compared to the total number of apprentices in Queensland which was 21,302 in 1977, or even the 5495 new apprentices, the number of students in this program was small. However it should be noted that the program commenced on a pilot basis and was extended in 1979 to many more technical colleges. It is a significant program in terms of possible future developments. The Minister for Labour Relations in Queensland was reported as suggesting the introduction over the next five to 15 years of a system of training involving an introductory year of pre-vocational polytechnical training, leading to a trade specific pre-apprenticeship course, and culminating in a final shorter period of indenture as an apprentice (The Telegraph, 18 April 1978, p5). Indeed in the same statement it was envisaged that the apprenticeship system might give way to full-time training in colleges supplemented by a systematic program of work experience.

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[1] It can be noted that in 1979 it was offered at an increased number of colleges. Other similar programs concerned with different groups of trades have been developed.

Course aims

The aims of this program were expressed in a general objective and a series of specific objectives. The general objective was:

> To provide students with a full-time educational programme, prior to employment, which will develop a range of immediately usable skills and knowledge and which will also develop an awareness of differing attitudes and values present in society.
>
> (Queensland Department of Education, 1978a)

A series of specific objectives amplified this general aim.

> The course is intended to allow the student:
>
> 1 To develop the basic skills, technical knowledge and understanding that constitute the prerequisites for subsequent industrial training across the broad spectrum of trade-based occupations.
>
> 2 The opportunity to progress to a specialized vocational education associated with the particular calling in which a student has displayed a particular aptitude and level of ability to successfully complete and which offers the opportunity for future employment, advancement, security and personal satisfaction.
>
> 3 An educational experience which is a useful unit in the development of persons who subsequently may not choose to follow a technical vocation.
>
> (An alternative to Grade 11 for students who do not wish to undertake tertiary studies.)
>
> 4 A means of developing an interest in and making an objective choice of a particular occupation or a career.
>
> (Information on the nature and extent of work opportunities and requirements of various industrial occupations.)
>
> (Adequate student evaluation and counselling to ensure placements in an area of training selected to suit the student's level of ability.)
>
> 5 To develop desirable personality traits, attitudes and work habits.
>
> (A means of bridging the gap between school and society.)
>
> (Queensland Department of Education, 1978a)

As evident from the stated objectives, the program incorporated the notion of developing general vocational skills, broad educational development, and preparation for an informed choice of occupation. In the area of vocational skills it was intended to develop basic skills and technical knowledge across a broad spectrum of trades but also to provide for gradual specialization in a particular trade.

Course structure

To achieve the objectives set out above there were two broad groupings of studies within the curriculum: technical studies and general studies. General studies were taken over the whole 35 weeks of the course and encompassed the subjects communication skills (three hours per week designed to increase competence in reading, writing, speaking and listening), human relations (between two and three hours each week concerned with developing a student's maturity and an understanding of himself, his social environment, and his work environment), and human movement (four hours per week concerned with occupational safety, physical fitness and leisure).

The course was divided into five modules each of seven weeks duration. Over the five modules there was gradual specialization in the technical studies as represented in Figure 3.1.

The first three modules were general and encompassed general skills in trades practice, drawing, calculations and science. At the beginning of the fourth module, students elected to study in either an engineering or construction semi-specialization. In this module there was some specialization in the trades practices, drawing and sciences. For the final seven week module, students specialized in one of the five trade groups indicated and took all their technical studies in those groups.

Within this structure were contained several types of integration. Firstly, there was integration of skills common to groups of trades covered in the general and semi-specialist modules. These were specified in the syllabus (Queensland Department of Education, 1978a) and represented a bold advance in thinking about trade training. This approach provided a start towards applying the notion of adaptable occupational skills discussed in the previous chapter. Secondly, there was integration between the general and technical studies, so that general studies were related to the industrial and social environments in which students would work. Finally there was integration between theory and practice which occurred because the course involved a core of teachers who were committed to it and a relatively small group of students. However the course did not involve any systematic work experience or experience of full scale construction.

Relationship to further courses of study

Even though the polytechnical pre-vocational program had rather broad aims it was developed with the intention that many of its graduates would enter apprenticeships. Exemptions from the conditions of a normal apprenticeship were not so extensive as for the pre-apprenticeship course in carpentry and joinery which have been described previously. A graduate of the polytechnical pre-vocational program was entitled to exemption from Stage I of the relevant apprenticeship course and a reduction of six months from the normal four years of an apprenticeship (Queensland Department of Education, 1978a).

A new development

The description above applied to the program offered in 1978. After extensive reviews by the Curriculum and Evaluation Section of the Education

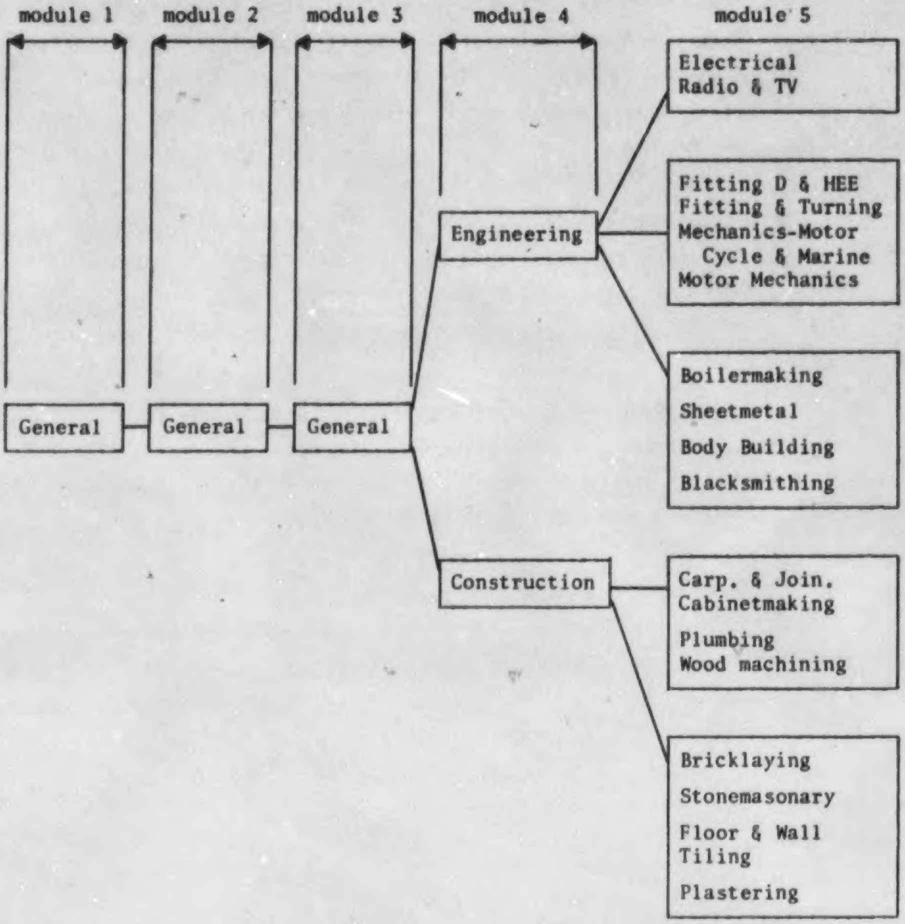
module 1
module 2
module 3
module 4
module 5
General
General
General
Engineering
Construction
Electrical
Radio & TV
Fitting D & HEE
Fitting & Turning
Mechanics-Motor
Cycle & Marine
Motor Mechanics
Boilermaking
Sheetmetal
Body Building
Blacksmithing
Carp. & Join.
Cabinetmaking
Plumbing
Wood machining
Bricklaying
Stonemasonary
Floor & Wall
Tiling
Plastering

Figure 3.1 Pre-Vocational (Trade-Based) Course

Source: Queensland Department of Education, 1978a.

Department's Technical Education Branch the program was both amended and offered more widely in 1979. The main change was to provide for earlier specialization in the program. Three modules of 14, 8, and 14 weeks duration were included. The first of these was general, the second semi-specialized and the third specialized. The basic structure and intentions remain similar.

A Full-Time Certificate Course in Chemistry

Certificate courses in New South Wales and other states have been established for some time and provide training of a semi-professional nature for intending technicians. In that state as elsewhere they have grown rapidly as employment patterns in industry have changed. Until recently these courses in New South Wales have been undertaken by part-time study. Parallel with the introduction of full-time pre-employment courses in skilled trades in 1973, a number of full-time pre-employment courses at certificate level were offered for the first time. They were intended to provide an opportunity for full-time vocational study for young people leaving school after Year 10 (New South Wales, 1974). The first courses offered on this basis were in electrical engineering, mechanical engineering, commerce, and architectural drafting. Two years full-time study was involved after which a student completed a third year of part-time study in combination with related employment. Subsequently other pre-employment certificate courses were offered.

The introduction of pre-employment certificate courses was guided by an expressed wish to provide greater diversity in post compulsory education, and smooth the transition from secondary schooling to work (New South Wales, 1974). It was hoped to extend the range of vocationally oriented courses available to young people. The provision was seen as directed towards young people who were faced with the choice of pursuing a general school course out of line with their interests or leaving school to commence work at a level which gave little scope for future development. It was stated that the main purpose of the courses was to enable the achievement of vocational competence in middle level occupations. In its annual report for 1975 the New South Wales Department of Technical and Further Education noted an increased demand for full-time study which they attributed to the growth of unemployment in the community (New South Wales, 1976). In particular it observed a notable growth of full-time enrolments in certificate courses.

From the beginning of 1977 pre-employment certificate courses were replaced by full-time certificate courses. This rationalized the provision of certificate level courses, as the full-time provision led to the same award, had the same entrance requirement, and most subjects were the same as for the part-time courses. However, the full-time courses were to include some additional subjects to compensate for the lack of work experience and some liberal studies subjects (New South Wales Department of Technical and Further Education, 1977a). For the purpose of this project it is important to note that the provision of full-time certificate courses in New South Wales grew out of pre-employment certificate courses.

The certificate course in chemistry was of interest for several reasons. Firstly, it was a course which provided a general training for a range of scientific occupations. Secondly, there were similar numbers of male and female students in the course. Finally it was a course which had attracted a steady enrolment over a number of years. Part-time enrolments had been ranged from 635 to 682 over the years 1977 to 1978 while full-time enrolments in 1977 and 1978 were 59 and 112 respectively.

Course aims

The aim of this course as stated in the syllabus was both specific and vocationally oriented.

> To educate students in the basic aspects of chemistry, chemical technology and associated subjects, in order to achieve the standard of competence expected of the chemical technician in such areas as production, quality control, research and development and technical service.
>
> (New South Wales Department of TAFE, 1977b)

Course structure

The course was structured around four stages which could be taken full or part-time in a number of combinations.

(a) All stages part-time; OR

(b) Stages I and II full-time in one year followed by Stages III and IV part-time; OR

(c) Stages I and II full-time in one year followed by Stages III and IV full-time in one year; OR

(d) Stages I and II part-time followed by Stages III and IV full-time in one year.

The subjects involved in the course and the time allocated to them for both full-time and part-time students is shown in Table 3.6. It can be seen that the total teaching time in most subjects was greater for full-time students. Additional practical work occupied most of the extra time and was included to compensate for the students lack of industrial

Table 3.6 Structure of the Chemistry Certificate Course

		Part-time			Full-time		
Stage	Subject	Yr	Hours per week	Total hours	Yr	Hours per week	Total hours
1	Practical Chemistry	1	2	72	1	8 (wks 1-12)	96
	Chemistry 1		3	108		9 (1-18)	162
	Mathematics 1		1½	54		4 (1-18)	72
	Physics		3	108		3	108
2	Laboratory Technique 1	2	4	144	1	8 (13-36)	144
	Chemistry 2		2	72		9 (19-36)	162
	Mathematics 2		1½	54		4 (19-36)	72
	Tech. Communication [a]		2	72		4	144
3	Laboratory Technical 2	3	4	144	2	12 (1-18)	216
	Analytical Chemistry 1		1½	54		4 (1-18)	72
	Organic Chemistry 1		1½	54		4 (1-18)	72
	Unit Operations		1	36		3 (1-18)	54
	Applied Physical Chemistry		2	72		5 (1-18)	90
4	Advanced Technical	4	2	72	2	6 (19-36)	108
	Analytical Chemistry 2		2	72		6 (19-36)	108
	Organic Chemistry 2		2	72		6 (19-36)	108
	Industrial Chemistry		3	108		8 (19-36)	144
	The Australian Chemical Industry [b]		1	36	and	2½(1-18) 4½(19-36)	126
	TOTAL hours						

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[a] For full-time students this includes Liberal Studies

[b] For full-time students this extends over two semesters.

experience. An important issue raised by this program was the extent to which it has been possible to compensate for this lack of industrial experience in a vocational program.

The Four Programs in Retrospect

The four programs described in this chapter have been concerned with different occupational fields. In addition the course structures were quite different. Yet there were many similar elements involved in the programs. All were concerned with the transition of young people from school to work. Each attempted to provide a vocational education which was concerned with the broad development of an individual as well as with occupational skills. In most of the programs there was a concern with adaptable occupational skills rather than those skills confined to a particular job. Above all in each program there was an attempt to compensate for the lack of work experience of these students. These programs represented specific responses to the general issues discussed in Chapter Two.

CHAPTER 4

EVALUATION

Evaluation occurs frequently as teachers make judgments about a variety of aspects of their job. Such evaluation usually involves gathering evidence by observation and weighing this evidence to produce some judgments about the appropriateness of a particular educational program or teaching method. Informal evaluation of this sort may often involve unsystematic gathering of evidence and judgments reached quite unconsciously. This report is concerned with a more formal approach to evaluation intended to provide reliable evidence to assist in the making of sound decisions about pre-vocational education. Recent developments in the evaluation of educational and social programs are particularly useful in understanding how a systematic examination of evidence can lead to judgments about curricula in general, and pre-vocational programs in particular. The first part of this chapter will examine those developments that are most relevant to the evaluation of pre-vocational education.

The Purpose and Role of Evaluation

Evaluation is a widely used term which refers to a form of policy research. Its purpose is the appraisal of a program by means of systematic research. One well known definition of evaluation sums up the purpose of evaluation.

> Educational evaluation is the process of delineating, obtaining and providing useful information for judging decision alternatives.
>
> (Stufflebeam *et al*., 1971:40)

Within this definition are contained the twin purposes of taking decisions and reaching judgments. In a subsequent article Stufflebeam (1975) categorized the purposes of evaluation as either pro-active, through serving decision making, or retro-active in that it was concerned with accountability. This distinction is similar to that made by Scriven (1967) who identified two distinguishable roles of evaluation: a formative and a summative role. The formative role referred to the gathering of data upon which decisions could be made to improve a program or reduce its deficiencies. Formative evaluation would thus be conducted in conjunction with program development. Information from such an evaluation would be intended for use by those concerned with the operation of the program.

By contrast the summative role of evaluation referred to the use of evaluation in making judgments about the worth of completed programs.

Immediate improvement of the program under scrutiny would not normally arise from a summative evaluation. Rather, such an evaluation would attempt to determine whether a program had been worthwhile. The results of a summative evaluation might guide a decision about introducing a similar program in another context. In contrast to a formative evaluation the results of a summative evaluation would be destined for use outside the program. The benefits of summative evaluation are more likely to be long-term than short-term, though Scriven (1967) includes under summative evaluation the comparison of competing curricula perhaps with a view to choosing one for implementation.

It would be mistaken to view these roles of evaluation as mutually exclusive. Stake (1976) has argued that the distinction between formative and summative evaluation is seldom clear. One reason is that a program may contain various components such that what is summative for one component was likely to be formative for the total program. Consequently, it seems likely that any comprehensive evaluation of a pre-vocational education program will incorporate both summative and formative issues. In such an area it is important to reach judgments about the programs and provide information for their subsequent development.

In brief, the purpose of an evaluation refers to the decisions, or judgments, to be made about the program while the role of an evaluation relates it to the continued development of the program. A consideration of both of these aspects of an evaluation is important in developing an appropriate methodology.

The Scope of Evaluation

Evaluation may be conceived as having a narrow or broad scope. As evaluation has become more directed towards programs with complex origins and multiple purposes its scope has broadened. In an attempt to describe this broadening, Glass (1972) has referred to two generations of evaluation models. The first generation was characterized by its predominant concern with determining whether a program had achieved its stated goals or objectives. In brief, the scope was narrow. Often this approach involved the translation of goals into behavioural objectives and using tests to assess student achievement of those objectives. Among others, Scriven (1967) was critical of such an approach on the basis that other aspects of the program, such as the goals themselves, were not evaluated. The approaches to evaluation which Glass considered part of the second generation of curriculum evaluation models embodied a more comprehensive approach to the evaluation of curricula. In brief, these approaches viewed the programs under review as systems comprising a number of components. Though student achievement was not to be neglected it was considered as only one component of the total system.

One important aspect of the broader approach to evaluation described above was the seeking of more extensive information about the processes and products of the program under review. Information beyond that describing the achievement of goals is usually needed for planning purposes and is important for educational decisions. In the absence of systematic evidence about what has been taught, how it has been taught, and student reaction to such teaching, decisions about future developments would be arbitrary.

Another aspect of the second generation evaluation models concerns the programs with which they were concerned. Many of the curricula for which they were developed were concerned as much with bringing about changes in teaching processes as with increased student achievement. An adequate evaluation of such curricula needed to encompass the process goals. In the pre-vocational education programs described in Chapter Three there was an intention to provide for students some of the experiences of work. The extent to which this was achieved seemed an important part of the evaluation.

The area of pre-vocational education had similar characteristics to those in which the broad approaches to evaluation had evolved. For this reason the approaches to evaluation which were broad in scope provided a more appropriate guide than those in which the scope was narrow.

The Elements of an Evaluation

A key issue which arises in a broad approach to evaluation is that of the definition of the essential elements on which attention should be focused. It has already indicated that something more than the extent to which a single goal has been achieved would be required. For an evaluation to be systematic it would be necessary to operate within a framework of component elements.

One way in which the component elements of the evaluation of an educational program have been defined is by reference to the type of decision which they serve. Stufflebeam *et al.* (1971) identified four types of educational decision: planning decisions to specify objectives, structuring decisions concerned with the means to the objectives, implementing decisions and recycling decisions. Corresponding to these types of decision were four forms of evaluation.

1 Context evaluation embodied an attempt to examine the rationale for the objectives. It involved a consideration of problems in the educational setting and utilized mainly descriptive methods.

2 Input evaluation was concerned with an analysis of the ways existing resources could be utilized to achieve goals and of the additional resources which might be required for the program.

3 Process evaluation was directed to monitoring the implementation of a program, and in particular, to examining the actual instructional procedures which were used when the program was taught.

4 Product evaluation was concerned with the assessment of the attainments resulting from a program in relation to its objectives. This aspect of the approach was most similar to the traditional conception of evaluation.

The process of evaluation was envisaged as delineating the information required for a particular decision, obtaining that information by the collection and analysis of appropriate evidence, and providing conclusions in a form useful to those who are required to make a decision.

In addition to defining four types of decision, the settings in which decisions were taken were considered to be an important influence upon the way evidence would be gathered and analyzed. Some decisions would be made in a setting where the prime concern was the maintenance of an existing system, others would be taken with a view to making small improvements to an existing system, a few would concern innovative attempts to solve significant problems, and finally some would be concerned with utopian activity directed to radical changes in an educational enterprise. Stufflebeam et al. (1971) argued that different types of evidence would be appropriate, or admissible in different settings. For example, in a setting concerned with maintenance of an existing system, evidence concerned with monitoring performance of students would be appropriate. By contrast, in a setting concerned with innovation, evaluation would be more concerned with the processes involved in classrooms. However, one of the problems associated with applying this classification is that it is sometimes difficult to classify programs. Pre-vocational education could either be considered to be a large innovative setting, or a setting concerned with small improvements in an existing program. The basis for making such a decision is far from clear.

Taken together, the four types of evaluation described above constitute a framework which has some value for the continuous evaluation of new programs, such as pre-vocational education in Technical and Further Education. In fact, the approach has formed the basis of the monitoring of the introduction of Pre-Vocational (Trades Based) Courses by the Technical Education Branch of the Queensland Education Department (1978b). As the new course was introduced a continuing formative evaluation was conducted which involved all four types of evaluation being undertaken progressively.

Because it was developed with a view to assisting in the making of decisions, this approach is closely related to the type of decision being made. As a consequence it has been expressed in terms more appropriate for examining a program as it is introduced than for an extant program. Even though subsequent articles (Stufflebeam, 1975) have argued that the scheme could guide an evaluation concerned with accountability, the emphasis appears to have been upon forming decisions. For this reason it seems that its value as an evaluation scheme would be greatest for those programs in Technical and Further Education which were being monitored as they were introduced.

As a result of this approach to evaluation being based on the type of decision to be made, the elements defined are elements of the evaluation rather than elements of the curriculum to be evaluated. In the evaluation of an existing program it would seem better to base an evaluation on defined elements of the curriculum than on components of the decision making process.

An approach to the study of curricula which was similar to that of Stufflebeam, but was more directed to the elements of the curriculum, was that proposed by Dahllof (1971).

Dahllof proposed that outcomes could be regarded as a function of three other elements of the curriculum: objectives, frame factors and processes. Frame factors were those institutional features which might affect learning such as class size, teacher qualifications. As presented these elements were related to outcomes in a simple linear fashion. Even though they seem best considered as part of an interactive system, they do provide a useful basis for the substantive part of an evaluation. The four elements were considered to be embedded in the context of social, environmental and manpower demands.

Some similarities exist between the elements of the curriculum described by Dahllof (1971) and the four types of evaluation formulated by Stufflebeam (1971). There appears to be a correspondence between outcomes in the Dahllof approach and the product evaluation of Stufflebeam. Processes were mentioned by both. Frame factors, as described by Dahllof, would be included in the input evaluation proposed by Stufflebeam. A context evaluation would concern itself with course objectives and the social and economic setting of the program.

A further proposal regarding the elements of a curriculum which ought to be considered in evaluation was that of Stake (1967). Three bodies of information were considered to be important components of any curriculum.

1 Antecedents which were considered to be conditions existing prior to instruction which might affect student outcomes (e.g. student background characteristics, class size, resources etc.).

2 Transactions which could loosely be regarded as teaching processes and other curriculum related activities.

3 Outcomes were considered to be the effects of the program including among other things student achievement in relation to the program goals.

Finally it was indicated that an evaluation should include an examination of the rationale for the program. Even if it is only implicit the rationale indicates the philosophy, background and purposes of the program. Chapter Two of this report contains an analysis of the rationale for pre-vocational education.

The similarity between transactions and outcomes in this approach, and processes and products in the previous discussion is apparent. Antecedents is a category which included those aspects of a program which were designated frame factors by Dahllof (1971) but which is broader. It incorporates student background characteristics and teacher characteristics, two important factors which did not fit readily in the Dahllof approach. In a recent publication the Curriculum Development Centre (1976) has combined the proposals of Stake (1967) with those of Jansen et al. (1972) to suggest that antecedents are made up of background characteristics and stable contextual factors. Goals were not omitted from Stake's suggested framework. They were included in two places: in the rationale for the program and in the intents related to antecedents, transactions and outcomes. In both the rationale and the intents an attempt was made to encompass goals broader than specific objectives.

In these approaches to curriculum evaluation there appear to be a number of common features. While the elements of a curriculum which were considered to be important facets of an evaluation were not identical in each approach there was considerable similarity. As a consequence it seems reasonable to suggest the important elements with which an evaluation in pre-vocational education should be concerned.

1 The rationale and goals of the program (including a consideration of the social and economic factors leading to the establishment of the program).

2 Antecedents relevant to the program.

3 Transactions, or teaching processes.

4 Outcomes.

Methods of Gathering Evidence

Recent emphasis on the evaluation of wide ranging social and educational programs has had repercussions on the breadth of evidence collected. In general, the evidence now admitted in evaluation studies is broader than was the case a decade ago. Some of this broadening has resulted from a concern to attend to the evaluation of processes as discussed earlier. One development was to make greater use of observational data within the framework of flexible research designs, and thus allow unanticipated events to be taken into account (Stenhouse, 1975:113). Nevertheless there are evaluators who still argue for rigorous quantitative methods of data collection within the framework of tight designs (Cooley and Lohnes, 1976).

Though the varied approaches to the gathering of evidence are sometimes seen as conflicting we contend that they should be regarded as complementary. For example, questionnaire and survey methods of determining student perceptions of classroom process complement structured and unstructured observation techniques, in the study of classroom processes. Different methods of gathering evidence should be used to provide information about different facets of a program and different perspectives on any given facet of a program. If different methods provide compatible information the validity of any conclusion will be enhanced. If the information obtained by different methods is not consistent then further investigations should be undertaken to try to discover the reason for the discrepancy. In either case something valuable about the program will have been identified for sometimes it is useful to know that different methods of enquiry yield different results.

The Management of Evidence

As part of an evaluation it is necessary to establish a framework within which the evidence which has been collected can be organized prior to analysis. This process does not refer to the technical aspects of data analysis but the prior organization of evidence in a framework. One framework for this process which would be appropriate to the evaluation of pre-vocational education is that proposed by Stake (1967).

Stake (1967) argued that two major activities were essential to evaluation: description and judgment. Description concerned not only such things as student background characteristics and past achievement but the description of instruction and the relationship between the type of instruction and outcomes. Judgments involved comparisons between various aspects of a program and a set of standards.

The objects of description were the three elements previously discussed: antecedents, transactions and outcomes. Description of these elements involved what was intended, or the goals of the program in relation to each element and ovservations, or what actually happened in the program. From these considerations three types of analysis were suggested.

1 An examination of the congruence between intentions and observations regarding antecedents, transactions, and outcomes.

2 An examination of the logical contingencies, or relationships between the intended antecedents, transactions, and outcomes.

3 An examination of the actual, or empirical, contingencies between the observed antecedents, transactions, and outcomes.

Thus the framework for description was a comprehensive one going beyond the collection of descriptive information about individual elements. Though it was descriptive of the program it was concerned with the relationships between the elements in a program.

Judgment was concerned with conclusions about the program in relation to an external standard. It was argued that judgments could involve not only outcomes but also transactions and antecedents. Furthermore, two bases for reaching judgments were described.

1 Judgments involving relative comparisons between the program under review and an alternative to it.

2 Judgments involving absolute comparisons between the program and a defined standard of excellence.

Hence it is possible to set criteria for judging programs which are appropriate for the type of decision which is to be made. These two approaches to judgments in evaluation are analogous to the concepts of 'norm referenced' and 'criterion referenced' tests in the assessment of student performance.

The issue of comparative and absolute judgment in curriculum evaluation has been extensively debated in the literature. Cronbach (1963) has argued that comparative judgment is inappropriate in evaluation research because of the confounding effects of intra and inter-class variability and the inability to randomly assign subjects to treatments. On the other hand Anderson (1969) has contended that, in spite of the technical difficulties involved, comparative judgment can provide much valuable information for people making decisions. It would seem that comparative judgments are an important part of evaluation in those fields where it is hard to establish absolute standards. Pre-vocational education is such a field.

Multiple Criteria

In previous sections of this chapter attention has been drawn to the broad concepts of evaluation which abound. Different roles for evaluation are now recognized, attention is focused on other aspects of programs than measurable outcomes, and a variety of sources of evidence are recognized as admissible. However, even if attention were restricted to the evaluation of program outcomes it would be apparent that there were multiple criteria for the evaluation of most educational and social programs. This results from the breadth of the goals of many of the programs which have been evaluated. From the discussion in Chapter Two it is clear that pre-vocational education in Technical and Further Education is directed towards a number of goals.

Many programs are designed to achieve both short-term and long-term goals. Suchman (1971) argued for distinguishing immediate, intermediate, and ultimate goals. This provides a useful way of considering the expected impact of a program over an extended period of time. It carries the implication that to judge a program on the basis of one single immediate outcome would be inadequate. From the rationale for pre-vocational education it was apparent that immediate, intermediate, and ultimate goals were involved. Therefore programs in this field could not be evaluated properly on the basis of one immediate outcome.

Irrespective of the time dimension many educational programs, and certainly those in the pre-vocational field, incorporate several goals. In this circumstance an important problem is to determine how much emphasis should be placed on each goal in the evaluation of the program. One recent article (Edwards, Guttentag and Snapper (1977)) indicates that decisions are based on 'stakes' as well as 'odds'. It was argued that an evaluation needed to provide information about how highly valued is a given goal as well as an indication of the probability that the goal had been achieved. It follows that the partial achievement of a highly valued goal may deserve greater consideration than the complete achievement of a relatively trivial goal.

Significance and Probability

A traditional practice in educational research and evaluation has been to refer to the statistical significance of a result. In the terms defined previously in this chapter this could involve either description or judgment. In judgment it could refer to the significance of a difference in scores on some outcome measure: either between an experimental and control group, or between one group and a reference standard. In the description of contingencies it could be used to test whether a correlation or regression coefficient is significantly different from zero. Much educational research adopts an arbitrary level of significance for accepting a result. Commonly, a result is accepted when the probability that it occurred by chance is less than five in one hundred (.05). Such a criterion is believed to balance the chance of rejecting a valid proposition (a type 1 error) against the chance of accepting an invalid proposition (a type 2 error).

Among the practical difficulties associated with the interpretation of quoted significance levels are those associated with sample size. Relatively few educational studies make use of a power test to guide the choice of sample size and define acceptable levels of significance. Consequently in studies with small samples substantial differences, or correlation coefficients, can be reported as statistically non-significant. Conversely, with very large samples comparatively trivial differences can be reported as statistically significant. For this reason Cronbach (1975) has been critical of arbitrary significance testing. Like Carver (1978), who has identified other misconceptions about significance testing, he argued for reporting the size of effects, whether significant or not. Carver also recommended that proponents of significance testing should calculate the power of their tests: a recommendation reinforced by Cronbach and Snow (1977). As a further illustration of the complexity of the problem Ross (1976) has shown that for a complex sample design the effective sample size needs to be estimated before probabilities can be calculated.

The choice of an acceptable level of significance is even more crucial in evaluation studies than in research studies. An argument for the use of the five per cent and one per cent levels in research studies has been that it serves to guard against accepting false hypotheses as true. This caution may be appropriate when generalizations are being formulated, but the context is different for evaluation studies. In evaluation the policy consequences of rejecting a true proposition cannot necessarily by considered to be less profound than those of accepting a false proposition. For this reason the determination of an appropriate level of probability for statistical significance is important.

Consider as an example the issue associated with the job satisfaction of graduates of pre-vocational courses intended to lead to apprenticeship. In particular, consider the question of whether job satisfaction differs between those who are apprenticed and those who are not. Some results obtained from a small sample of students have been reported in Table 4.1. It can be noted that the probability associated with the difference between the two means is eight per cent. Such a result would be rejected as not significant at the five per cent level in conventional terms, even though the difference between the means was about half a standard deviation.

An alternative approach to the problem of appropriate significance levels has been outlined by Nagel and Neef (1977). They indicated how an optimum level of significance might be reached by balancing the costs of a type one error against those of a type two error. A form of decision theory provided a basis for this approach. Given a clearly stated proposition it is possible to develop a four cell matrix based on the proposition being true or false in combination with its acceptance or rejection. Acceptance of a true proposition and rejection of a false proposition would be desirable outcomes. Rejection of a true proposition or acceptance of a false proposition would be undesirable. The approach required the assignment of quantitative values to relative undesirability of the two which are undesirable. One might assign a value of -A and the other -B if the former were A/B times more undesirable. Once such an assignment had been made positive values could be assigned to the other outcomes on the basis that they should mirror the first two assignments of value (i.e. +A and +B). Nagel and Neef then showed that the probability for rejection of the proposition, which was consistent with the previous assignment of value, could be calculated as

$$p = A/(A+B).$$

On this basis it can be shown that the acceptance of a probability level of .05 implies that a type one error (wrong rejection of the null hypothesis) is nineteen times more undesirable than a type two error (wrong acceptance of the null hypothesis). In many evaluation studies such a view would not be

Table 4.1 Mean Scores on Job Description Index for Graduates of Courses Leading to Apprenticeship

	Mean	Standard Deviation	Number of Cases
Gained apprenticeship	144.57	30.03	30
Not apprenticed	127.16	36.55	19
Total	137.82	33.46	49

F = 3.301. P = .08.

consciously endorsed. For this reason careful thought needs to be given before accepting arbitrary levels of significance in evaluation studies.

Consider again the example of job satisfaction among graduates of pre-vocational programs. Expressed explicitly, the proposition being investigated is that graduates of those courses who gain apprenticeships experience greater satisfaction at work than those who do not gain apprenticeships. The validity of that proposition would have important implications for policy regarding career counselling and job placement assistance. Two issues which might affect judgment about this proposition would be the extent to which job satisfaction among young workers is valued and the cost of helping such people to obtain apprenticeships. Suppose that on this basis false acceptance was considered more undesirable than false rejection, but that the former was only five times more undesirable as the latter. Notice that this is still an essentially conservative stance. Under those assumptions the values of -100 and -20 would be assigned to each of the errors. Thus the probability for accepting the proposition would be

$$p = 20/(20+100) = 0.17.$$

Hence, given the assumptions stated, the difference in job satisfaction between apprentices and non-apprentices would be significant for policy formulation.

The assumptions made in the example above were based on our subjective opinion. They were stated for illustrative purposes only. Nevertheless, it may also be arbitrary to assume that false acceptance is 19 times more undesirable than false rejection. The virtue of this approach to significance in evaluation is that it forces one to make explicit assumptions which would otherwise be concealed.

It is possible that approaches similar to this will become more general in educational evaluation in the future. In the case of pre-vocational education it would be inappropriate to use arbitrary significance levels in interpreting the results of evaluation. Rather, a more detailed consideration of appropriate probabilities would be a more appropriate means of considering results. In addition, it should be recognized that the participants in programs need to be involved in the process of allocating values to different types of error. Subsequent chapters indicate some first attempts to ascertain the priorities of different participants with regard to the multifarious goals of pre-vocational education.

Studies of Pre-Vocational Education

As a consideration additional to the general features of evaluation discussed in the previous sections of this chapter it is worth mentioning some specific aspects of research and evaluation in pre-vocational education. Among studies conducted in this area attention has been given to important issues, general frameworks, and relevant techniques of gathering data.

Issues in pre-vocational education

Kaufman (1971) discussed several important issues involved in evaluating occupational programs in Canadian schools. Occupational programs in that context can be considered as approximately equivalent to the pre-vocational programs described in Chapter Three. One of the fundamental issues she raised was the disagreement which existed about the priorities of vocational courses. Most vocational courses contain goals concerned with general citizenship, or personal and social development in addition to goals concerned with skill training. Kaufman suggested that it was not possible to determine the extent to which these goals are in conflict. However, it does seem important to attempt to determine the different priorities allocated to the multiple goals of a program by different groups of people.

An additional point raised by Kaufman concerns the difficulty of determining indicators of a program's success. It is unclear what level of performance is expected of students since background characteristics often differ from those in comparable programs, and are strongly associated with their attainment. This makes difficult the choice of standards against which to judge a program. Even rate of employment would provide a dubious indicator of the quality of a vocational program because it is subject to so many other

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influences: general employment opportunities in the region, variation in the qualifications set for different jobs, and the arbitrary nature of the criteria used for employment selection.

Criteria of effectiveness

A series of studies reported by Freeberg (1969, 1974, 1976) has been concerned with various aspects of training programs for youth in the United States. Some studies have concerned the development of measures which predict the employment success of those enrolled in the programs (Freeberg and Reilly, 1971). Other studies have concerned more directly the development of criterion measures for the programs themselves (Freeberg, 1976). The programs which were examined by Freeberg were generally directed to a group who were more socially disadvantaged than students in pre-vocational programs in Australia. In addition, the social context in which the programs were conducted differed vastly from Australia. Nevertheless, it is possible to infer from the results Freeberg has reported, a number of dimensions which are likely to be useful in evaluating this type of program.

Among the criteria for examining the immediate impact of vocational programs which appeared relevant to the present study were:

1 students' proficiency as rated by others (this can be taken to include both technical knowledge and practical skills),

2 students' self-concept or self-confidence,

3 positive work orientation, and

4 attitude to further training and achievement.

Freeberg (1976) was also concerned with assessing the longer term impact of programs. In looking at the longer term impact of pre-vocational education, four criteria which are a little different from those advanced by Freeberg, seem appropriate:

1 The rate of employment,

2 Job stability,

3 Job satisfaction, and

4 Success in further study.

In drawing attention to the need to examine both immediate and long term outcomes of work preparation programs, and in examining multiple criteria at each level of impact, Freeberg was applying in this specific context, ideas which were developing in the general field of evaluation.

Methods

One of the most common methods used in the evaluation of courses similar to those examined in this report has been to follow up past graduates of these courses. Isabelle and Lokan (1973) have argued the merits of the follow-up study as a means of gathering evidence about a program's effectiveness. At the very least such a study can provide descriptive information about the nature of the jobs students have entered, how easily they have obtained them, their job intentions, and their satisfaction in work. This information, in addition to the perceptions of their course, could provide valuable information for course planners. The follow-up study was conducted by means of questionnaire supplemented by personal interview of both the student and their employer. Similar follow-up studies using this general range of methods have been reported by McGowan, Mongerson and Carter (1971).

In a review of program evaluation in vocational education, which was mainly concerned with the United States and Canada, McKinney (1977) discussed a range of methods used in evaluation studies. McKinney argued that a follow-up study should be directed to those who did not complete the course of study as well as those who did succeed. Wentling and Lawson (1975) provided considerable information about conducting a questionnaire study through the use of successive reminders. Another study (Heberlien and Baumgartner, 1978), though not directly concerned with pre-vocational education, has detailed the factors affecting response rates to mailed questionnaires. That study involved a meta-analysis of response rates from nearly 100 questionnaire surveys. It seemed that the most important feature associated with a high response rate was the salience of the questionnaire to the respondent. Even though the length of the questionnaire, and procedural details had some influence, these were less important than the extent to which individuals saw the questionnaire as directed to issues of direct concern to them. The evidence presented by Heberlien and Baumgartner also showed the benefits of several reminders to those who did not initially return the questionnaire.

Surveys of employers have been used in several evaluation studies of vocational courses. Wentling and Lawson (1975) considered that employer views could be obtained about the course, likely supply and demand for labour in the area and the performance of graduates of the course. There would appear to be ethical problems involved in asking about the performance of individual graduates. Such enquiries could make an employer aware of previously unnoticed deficiencies. An employer survey concerned with these issues would need to be treated very carefully. There are also practical difficulties involving employer surveys. One practical problem is the definition of the target population for programs not directed to a specific occupation. A second is to define who in a large firm should be approached for information. Finally, there is the question of an appropriate method of obtaining information. Individual interviews are time consuming, but mail questionnaire surveys of employers' views are likely to have a low response rate because of the other demands upon an employer's time.

McKinney (1977) noted that students and parents were important sources of information about a program, since they were most affected by the program. He also observed that they were not used as important sources of information as frequently as might be expected. This was surprising as they constituted a source of information which was most readily obtainable.

The methods used to gather information for the evaluation of pre-vocational and vocational programs have mainly involved questionnaires and interviews. They have been directed towards employers, former students, present students, and parents. Observation of either classes in college or former students at work does not appear to have formed a major part of many evaluation studies in this field.

Key Features of Australian Studies

There have been several interesting Australian evaluation studies in pre-vocational education or similar fields. The Queensland Department of Education (1978b) in a study of its Pre-Vocational (Trades-Based) Course gathered the opinions of students, teachers and employers by means of questionnaire and interview. As mentioned earlier in this chapter, this study was based on an analysis of Context, Input, Process and Product as defined by Stufflebeam *et al*. (1971). Mackay *et al*. (1978b), who were concerned with a more general range of technical courses, gathered information from potential students and those who withdrew from the courses, in addition to students, teachers and employers.

An extensive study of Accelerated Apprenticeship Training by Griffin (1978) sampled the views of teachers, employers and apprentices as well as assessing apprentice performance. This study was conducted within a theoretical framework derived from Stake's (1967) countenance model. A systematic framework of this type provided a valuable guide to the determination of data which needed to be collected.

Kuhl (1978) argued a rationale for curriculum evaluation based on three criteria: curriculum function, curriculum process and curriculum theme.

Important facets of the curriculum function criterion were the specification of tasks, and skill profiles, of jobs in relation to objective methods and outcomes. For this reason it is a rationale more appropriate for programs directed towards specific occupations than general courses. Schilling (1978) has reported an occupational survey of the automotive paint refinishing industry as an example of this facet of curriculum evaluation. As part of this job profiles of workers were developed, their training needs analyzed, and information about trends and developments in the industry collected. Information was collected by survey questionnaire and by interviews with employers and tradesmen conducted at the workplace. This example showed the value of a detailed analysis of the working environment when planning courses of training for specific occupations.

The views of past and present students, employers, teachers and professional associations formed the basis of an evaluation of a certificate course in business studies conducted by Cutter (1977). Problems associated with survey studies of employers were raised in this evaluation. Cutter commented that a significant number of questionnaires were returned incomplete and that many were not returned at all. Part of the problem would appear to be in defining the appropriate group of employers to whom the questionnaire should be directed, and in developing a questionnaire which appears equally salient to the range of employers to whom it will be addressed.

Studies involving comparisons between new developments and traditional apprenticeship have been reported by Hutchison (1978) and Griffin (1978). Hutchison (1978) compared the performance of students from a pre-apprenticeship course in signwriting and screen-processing with that of students in a normal apprenticeship program. A series of 't-tests' were used to test the significance of the difference in performance between the groups. No significant difference was detected. Griffin (1978) sampled students from an Accelerated Apprenticeship Training Scheme and from normal apprenticeship as part of the study described previously. Rather than involve simple comparisons between the groups, he conducted a more complex multivariate analysis using the type of program as one variable. The latter approach is probably a more appropriate method of analysis in such a complex field.

Among the problems of research in vocational and pre-vocational education, is that of dissemination. It is possible to find reports of individual studies, though not all studies in the area are widely reported. However, there are no extensive and critical reviews of Australian research in this area. Such reviews would not only guide policy but would be of great value in the continuing development of appropriate research methodologies.

CHAPTER 5

AN EVALUATION FRAMEWORK

The four pre-vocational education programs described earlier in this report have been chosen for study because they incorporated some of the new developments in this field. Two major problems involved in developing an evaluation strategy were the diversity of the occupational fields served by the programs and the breadth of the goals of each program. As a method of considering the broad ranging set of goals of these programs a strategy based on the approach to evaluation suggested by Stake (1967) was adopted. In order that the strategy might accommodate the diverse occupational fields involved, intended outcomes were classified as either general to most pre-vocational programs or specific to the program under examination.

During the process of developing this approach to evaluation we rejected the proposition that it was possible to formulate a rigid methodology which would be applicable to all full-time pre-vocational education programs. The wide range of programs in this field was such that any attempt to achieve this would not have succeeded. In addition it was apparent from the literature on educational evaluation that the form of an evaluation depended on the particular aspect of the program to be evaluated. Though the present study has attempted to be wide ranging, it has focused on issues involved in the transition from school to work. Other evaluation studies of pre-vocational education might be concerned with rather different aspects of the programs. The evaluation strategy which evolved was therefore sufficiently broad to be adapted to the evaluation of various aspects of different types of pre-vocational education programs.

This chapter contains an account of the procedures which were used in developing the framework, a general outline of the framework, and a detailed description of the main elements of the framework. Consistent with the discussion in Chapter Four the main elements of the framework have been considered within the categories background factors, processes, and outcomes. In this way an attempt has been made to define the essential elements of pre-vocational education on which an evaluation strategy could be based.

Development of the Framework

Even though an approach to evaluation based on the suggestions by Stake (1967) was adopted it was necessary to refine this approach to suit the context of pre-vocational education. This refinement took place in three stages. In the first stage, which was exploratory, visits were made to colleges, classes were observed and interviews were conducted. The second stage involved the trial of some instruments in a small number of colleges in Victoria. Finally, as part of the third stage, there was a more rigorous trial of procedures in four pre-vocational education programs.

Preliminary visits

The major purpose of the initial visits was to meet those people who had developed or who were now teaching the programs. From discussions with those people it was possible to elucidate some of the key issues for the evaluation, to learn about the background to the programs, and to establish procedures for later phases of the project. In addition, it was possible to determine the nature of data held on official files, and the extent of other research studies being conducted.

After the preliminary visits it was possible to formulate a broad outline of the evaluation strategy to be adopted and to develop some instruments for trial. The trials involved interview schedules, semi-structured observation schedules, and questionnaires.

Class observation

During the second visits to colleges, classes of different types were observed in operation in each of the four programs. The purpose of this activity was to determine if the activities used by instructors in practice reflected the intentions of those who designed the program. It was important to know what actually happened in classes in order to structure some sections of the questionnaire appropriately. In brief, the class observations were intended to be exploratory rather than confirmatory. To assist in recording observations a semi-structured observation schedule was used. This schedule was primarily directed towards the extent to which an instructor attempted to relate the class activities to the world of work. It is important to note that this was a working guide to aid observation rather than a precise schedule. Such details as inter-rater reliability were not determined.

Interviews

As an additional component of the second visits to colleges a series of interviews was conducted with students and teachers involved in these courses. The purpose of the interviews with students was to learn a little of their background, their motives for enrolling in the course, their views about the course, and their work ambitions. An open-ended questionnaire was used as a guide for these interviews which were recorded on a tape recorder. The use of the interview guides did not prevent specific concerns of individuals being discussed. They merely provided a base of common ground between the interviews. Tape recording of the interview enabled questions to be framed in response to previous answers so that a dialogue was established.

Teachers were interviewed in order to obtain their views about a number of important features of the programs they taught. Once again a semi-structured interview format was used in conjunction with a tape recorder. Teachers were asked their views about the goals of the course, the difficulties faced by students, emphases in their teaching and the extent to which they considered that the course was successful.

The combination of visits, observation and interviews provided a perspective on important issues in pre-vocational education raised in the discussion of the rationale for this field and the goals of each program. Together with the literature relating to the transition from school to work these procedures enabled the major elements of an evaluation framework to be defined. The second and third stages in the development of a methodology for evaluation in pre-vocational education are described in the next chapter. The remainder of the present chapter describes the framework which was developed.

The General Framework

In the previous chapter it was argued that the elements of the curriculum identified by Stake (1967) provided a sound basis for the evaluation of pre-vocational education. It will be recalled that Stake had argued for a consideration of the rationale of a program and an examination, through description and judgment, of its antecedents, transactions and outcomes. In adapting this framework to the evaluation of programs of pre-vocational education we have preferred to use the terms background factors, processes and outcomes.

Background Factors

Among the important background factors in pre-vocational education were student characteristics, teacher characteristics, and contextual factors. Relevant students characteristics included their motivation, their career plans, previous schooling, and home and social background. Industrial experience and educational training seemed important teacher characteristics, and employment opportunity in the occupational area appeared to be an important contextual factor.

Student motivation

In the general rationale for pre-vocational education it was implicit that programs in this field would be directed towards young people wishing to move from school to work. Determining the reasons students entered the courses therefore would be an important feature of the evaluation. In examining the reasons why students entered the programs it was considered important to establish whether students were entering courses for positive reasons, by default, or because of social pressure. Positive reasons could be considered to arise from an extrinsic motivation to train for a particular job or from an intrinsic motivation to study something of great interest. Enrolment by default could arise as a result of a desired course of action, such as employment as an apprentice, being unavailable or as a consequence of general uncertainty. Social pressure could lead to enrolments in a program to please parents or be with friends. It should not be expected that for each student there would be one reason for commencing a course. Rather there would be a series of reasons of varying strengths. It is argued that the balance of strength among these reasons should be assessed. The way in which a program is structured and taught would generally take account of the motivation of the young people who were enrolled in it. Most pre-vocational education programs assumed that students were mainly concerned with training for a job.

Career plans of students

Closely related to the students' motivations for commencing the course were the students' job plans. Several aspects of their job plans on entry to pre-vocational education were considered. One was the extent to which they have a specified type of job planned for when they finish the course. As indicated in Chapter Three, some programs were intended to lead to a particular occupation while others had a more general orientation. It would seem to be relevant to know the extent to which the specificity of the students' intentions matched those of the program. In addition since the programs were concerned with the transition from school to work it would seem useful to know the sort of considerations important to the students in choosing a job. Information about this aspect of student ambitions would be of value in determining course structure and content.

Previous schooling

Several of the pre-vocational programs described in Chapter Three made assumptions about the school background of students entering the courses. Though none set a minimum entry requirement beyond the completion of Year 10, the actual entry levels seemed likely to differ between the courses. In one there had been a deliberate policy to provide for students who found Year 11 and Year 12 of secondary school unsuitable so that entry was not based on school ability. By contrast another course had originated with an intention of attracting some more able students, then pursuing other forms of post-compulsory education, to trade training. Given that there was some evidence that there were many more applicants then places in some courses, it seemed important to determine the actual school background of pre-vocational students.

A key element in the school background factor would be the student's attainment and achievement. By attainment is meant the level of schooling which has been completed and by achievement is meant the degree of success the students had at school. Of even greater interest in planning modifications to existing courses would be some knowledge of specific areas of deficiency in students' background knowledge and skills as suggested by Beeson (1978) for other programs. Though the determination of this was beyond the scope of the present project, its importance cannot be over-emphasized. Of some importance in the evaluation of pre-vocational education would be a knowledge of the reasons students left school, and the type of school the student previously attended. This information would appear relevant to the claim by at least one Technical and Further Education authority that pre-vocational education was helping students who had difficulty in an academic secondary school.

Home and social background

The home and social backgrounds of students entering pre-vocational programs were considered relevant in two ways. Firstly, information about the socio-economic level of the students was important in knowing which groups in the community were being served by these programs. Secondly, such information would indicate whether there was an association between a parent's or sibling's occupation and the type of occupation preferred by the student. This would be relevant to the general issue of the extent to which young people model their career plans on the occupations of others in their family.

Table 5.1 Background Factors in Pre-Vocational Education

Student characteristics	Motivation Specificity of career plans Previous schooling Home and social background
Teacher characteristics	Industrial experience Teaching qualifications
Contextual factors	Employment opportunities

Teacher characteristics

If the rationale for pre-vocational education were to be fully implemented in the programs described, a great deal would be expected of the teachers. In particular it would seem important that they possessed both a depth of experience in work outside teaching and an understanding of the art of teaching. The observations made of the programs in action seemed to suggest that pre-vocational education functioned best when these two qualities were present. These aspects of teacher characteristics seemed relevant to an evaluation of pre-vocational education.

Context

Finally among the background factors was a most important piece of information about the context. This was the opportunities for employment in the occupational areas served by the program. Information about employment opportunities would be important when interpreting the employment rates of graduates, as well as in planning expansion or contraction of the program.

In Table 5.1 the background factors of pre-vocational education relevant to its evaluation have been summarized.

Teaching Processes

In the study of the processes involved in pre-vocational programs attention was concentrated on three major issues arising from the role of these programs in the transition from school to adult life.

1 The extent to which students perceived their working conditions as similar to those of someone in full-time employment.

2 The degree to which the teaching methods closely related the program to the world of work.

3 The practical emphasis in the course.

In addition to considering these three elements of the process of pre-vocational education, two factors which could be better classed as pre-requisite outcomes, were studied. These two additional factors were not strictly processes but were thought to be important aspects of students' reactions to the course which would influence the extent to which desired outcomes were achieved. They would probably have been more easily included under the general term transactions.

1 Student satisfaction with program in which they are studying.

2 Student interest in the course in general and its components.

Each of these five elements will now be commented upon.

As part of the discussion in Chapters Two and Three, it was argued that work experience during adolescence was an important part of the transition from youth to adulthood. There appeared to be established theories of development which supported that view. It was argued that in times when young people had less opportunity to gain this experience it was important to provide similar experiences by alternative means. In addition there were pragmatic arguments that by providing an environment similar to that of work, students would be better prepared for work. As a result of these considerations, a number of important aspects of working conditions were defined. These included the responsibility a person was expected to accept, the usefulness and worthwhile character of jobs, being asked to decide how a job should be done, being treated as an adult, using modern equipment and being part of a team. Pre-vocational education programs were intended to provide an environment which was similar to work in these respects.

Teaching methods in pre-vocational courses were intended to be closely related to the world of work. This notion was defined as involving three main elements: an emphasis on 'useful' tasks and practical examples, consideration of the social aspects of work, and a concern with individual progress. These elements were considered to be inter-related components of the overall concept of work-related teaching.

Programs of pre-vocational education were intended to have a practical emphasis which was more pervasive than just the working conditions and teaching methods. It was considered important to attempt to determine the extent to which students viewed their program as practical.

It is not being suggested that these are the only important process variables worth examining in technical education or even in pre-vocational programs. The issues identified here are simply those which seemed most relevant to a consideration of the role of these programs in the transition from school to adult life.

Student satisfaction with any educational program is an important consideration as a pre-requisite to the achievement of course objectives. In pre-vocational education it is especially important because of the possibility that many students may have enrolled as a second preference after being unable to find work. Under these circumstances the level of satisfaction they express with the program is an important part of its success. Equally important, in this context, is the level of interest which they express in the program. It could be argued that to arouse interest in students who would prefer to be at work would be important in itself as well as important for the achievement of the programs objectives. It would seem probable that a program which did not arouse student interest would be less successful in leading to employment opportunities.

Program Outcomes

Throughout the discussion of pre-vocational education in Chapter Two and evaluation in Chapter Four, the importance of evaluating immediate, intermediate and enduring outcomes of programs was stressed. The programs under consideration at present were of relatively recent origin, as was the whole field of pre-vocational education. Consequently evaluation of the enduring outcomes of the programs was not possible and attention has been concentrated on immediate and intermediate outcomes. For convenience of expression the intermediate outcomes have been referred to as long-term outcomes, though we have defined them as outcomes measured one year after the completion of the program. Immediate outcomes were those which could be measured on completion of the program.

The types of variable to be considered as outcomes have been derived from an analysis of the general goals of pre-vocational education, the specific objectives of particular programs, and the outcomes which have been used as criteria in the evaluation studies of similar programs reviewed in Chapter Four.

Priorities

It was mentioned previously that one important and recent contribution to the theory of evaluation was the point that priorities attached to the different goals of a program should be examined in addition to the extent to which those goals were achieved. We were able to identify the general goals of the various programs from a consideration of the rationale discussed in Chapter Two. These goals related to job training, personal development, work attitudes, basic skills, and social learning.

Two important aspects of priorities among goals were considered. One was the emphasis which people felt should be placed upon the various goals. The other was the emphases which was actually placed upon these goals. The extent to which the intended and actual emphases on goals were congruent was an important part of the description of the program. The perspectives adopted by different groups of people about the program goals were also of interest. Certainly the views of students and teachers about the actual and intended emphasis on goals were relevant. Employer views about intended emphasis would also be relevant, though in the present study we have not attempted to obtain the views of employers.

In addition to considering the general goals of pre-vocational education, part of the examination of priorities involved asking teachers to rate the specific goals, or objectives, which were stated for each program. Such information, while highly specific to a given program, would also be useful if used in conjunction with teacher ratings of the extent to which each objective had been achieved. While the latter information may be rather subjective, when a median rating is taken across all teachers it can be used as one indication of the success of the program in relation to its objectives.

Immediate outcomes

At several points in this report the intended outcomes of programs of pre-vocational education have been discussed in relation to the rationale, specific objectives, and other studies in the area. The following outcomes were identified as being important and likely to occur immediately after the completion of the course.

1 Technical competence of the students in the occupational area or areas appropriate to the course.

2 Development of self-awareness and self-confidence among the students.

3 Attitudes to work among the graduates of the program.

Technical competence could be taken to embrace knowledge about the content of an occupational area, and the skills or techniques associated with the practice of the area. An important issue discussed in relation to full-time work preparation, or pre-vocational programs was the extent to which students develop skills to the same level as those who study part-time under such schemes as apprenticeship training. As previously indicated, it has been claimed that while full-time programs can develop students knowledge of an occupational field to the same extent as apprenticeship, and similar schemes, they are not so effective in the development of skills.

There are great problems in the assessment of technical competence because of the lack of appropriate established tests in many occupational fields. In the next chapter it will be seen that we have used some tests where possible and supplemented these by the use of teacher ratings.

The role of these and similar pre-vocational education programs in the personal development of students is thought to be important. In particular the value of realistic work-oriented tasks in the development of an occupational identity, and the potential for the development of higher self-esteem through the acquisition of technical competence, have been considered important goals of pre-vocational education. In this evaluation framework we have considered both aspects of personal development. Self-esteem, as defined by Coopersmith (1967) and explained by Ross (1974), has been taken as the variable representing the general aspect of personal development. Occupational identity is a notion much harder to represent in operational terms. For this study the consistency of choice among future possible occupations was used as an indication of the extent to which students developed a consistent pattern among their choice of occupation. There is some evidence that the consistency of a profile of occupational choices is related to the development of the ability to make decisions about careers and the definition of an occupational identity (Holland and Gottfredson, 1975).

In Chapter Two the need to define carefully the implications of the term 'attitudes to work' was discussed. It was suggested that attitudes to work should be distinguished from attitudes to particular employment structures. As a consequence in this evaluation framework two aspects of attitudes to work seemed relevant and consistent with those arguments advanced previously. The first was a positive attitude to choice of career as an important decision. The second was a desire to achieve satisfaction from good performance. In the next chapter, two scales which were used to measure these notions will be discussed. It should be emphasized that these two variables do not cover

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all the relevant aspects of attitudes to work which could be considered but they do define two relevant aspects.

It is worth considering career maturity in more detail. As discussed by Crites (1969) and Super (1957) this refers to the development of the ability to make decisions about careers or jobs. Crites (1973) has argued that career maturity involves making consistent and realistic choices, displaying competence in planning, and being positively oriented to the making of decisions. The Career Maturity Inventory (Crites, 1973) is based on a series of competence tests and an attitude scale. The competence tests are concerned with knowledge of one's own aptitude and of jobs, and skills in planning, choosing jobs and solving problems. An alternative approach is that of Super and Forrest (1972) in the Career Development Inventory, which is concerned with an individual's planning orientation, resources for career exploration and information and decision making. The full Career Maturity Inventory is a lengthy instrument to administer and has not been tried in the development of this methodology. One form of the Career Development Inventory is a research form and is rather shorter (Super and Forrest, 1972). This instrument was not tried in the development of the methodology either. However, the construct of career maturity did seem relevant to pre-vocational education and other studies in the field could use one of these instruments in its assessment. In the present study consistency of career choice was studied using a different approach related to occupational identity, and the attitude scale of the Career Maturity Inventory was tried as a measure of one set of attitudes to work. This has been reported more extensively in Chapter Six.

Intermediate outcomes

Follow-up studies of course graduates appear to have provided the most common means of evaluating programs similar to pre-vocational education. The major reason for the use of this as an evaluation method would appear to be a belief that a pudding cannot be judged until it is eaten. It is argued that for courses directed to work preparation, an assessment of what happens at work is essential. A second reason for the extensive use of follow-up studies could be the fact that it is difficult to define and measure immediate outcomes such as technical competence. However, a problem involved with the assessment of intermediate outcomes, by either longitudinal studies or cohort studies, is the fact that the longer after course completion the assessment is made the less certain is the association between the outcome and the course.

It will be recalled that in the discussion of issues involved in the transition from school to work, a successful transition was considered to involve more than obtaining a job. Job stability and job satisfaction were also considered important. Hence in the evaluation of programs of pre-vocational education three intermediate criteria seemed appropriate.

1 Rate of employment amongst course graduates

2 Job stability

3 Job satisfaction

Reservations about a simplistic use of employment rates as an evaluation criterion for pre-vocational programs have been expressed. Yet, for a vocationally oriented program some attention must be given to the employment of those people who complete the program. In the framework being advanced here it is argued that attention must also be given to whether the fields in which the graduates of the program obtain work are congruent with the field of the program. Though employment in another field has sometimes been considered misemployment this term is fraught with danger. As noted, even the most specific pre-vocational programs provide skills useful in a range of occupations. A person who completed a program in carpentry and joinery and obtained employment in a builder's hardware store ought not to be considered to be misemployed even though he did not commence an apprenticeship as a builder. In more general pre-vocational programs the definition of misemployment is even more difficult. For these reasons it is important to examine in detail the types of employment which former students enter as part of the study of employment rates. In addition it is important that when employment rates are considered that they be examined in the context of employment opportunities in the appropriate occupational field. As a result of such an examination it could be concluded either that the program was not producing skills suited to the vacancies which did exist or that insufficient vacancies existed to justify the program on a manpower basis. Or, the program might still be justified on other considerations.

Job stability has been mentioned in some official literature on pre-vocational education (TAFEC, 1977) and refers to the number of different jobs an individual holds in a given time, or the average time in each job. A number of important questions surround its use as a criterion of program effectiveness. One arises from the possibility that job changes could be made for a variety of reasons. In the current economic climate young people may be obliged to accept an inappropriate job with a view to changing to a better one as soon as possible. A second concerns the issue that it may not necessarily be a bad outcome for young people to try a number of jobs in the years after completing a program. A third, and final, issue concerns the fact that many job changes in some industries arise because of instability in the industry resulting in small firms closing down or retrenching staff. Consequently we suggest that job stability should be studied in detail and consideration given to:

1 overall job stability,

2 the types of job changes involved, and

3 the reasons participants give for changing jobs.

However, in terms of intermediate outcomes measured about one year after completion of a program, it would not be expected that many people would have changed jobs.

Job satisfaction has been argued to be an important, but neglected, aspect of the transition from school to work. It is probably more greatly influenced by the nature of the working environment than the program which was completed. However, a program in pre-vocational education could be considered to contribute to subsequent job satisfaction in two ways: by providing the opportunity to enter more satisfying jobs and by enabling an individual to adapt more readily to working life. Both of these factors, but particularly the second, constitute strong grounds for examining job satisfaction as an intermediate outcome of pre-vocational education. In considering job satisfaction in this way it is important to use measures which differentiate different components of job satisfaction rather than global measures. For the present study we have used a measure based on satisfaction with work, supervision, people, pay and promotions. The structure of the instrument is discussed more fully in the next chapter.

A further criterion for evaluating the intermediate outcomes of pre-vocational education is specific to some programs. Success in further studies undertaken by former students is an important measure of the success of pre-apprenticeship programs planned to lead into apprenticeship training and other more general programs intended to provide a broad introduction to such training. Performance in both the technical education and the job performance aspects of this training would be relevant, as would be evidence of the rate of withdrawal from apprenticeship.

In addition information from former students can provide valuable information about the usefulness of the program. This information could provide a further criterion: retrospective satisfaction with the program. Even though some might not consider this as a program outcome, it has been mentioned as part of this framework, at this point, because the information can be of great value in judging or modifying the program. In essence it provides information about the congruence between the program and the world of work.

Enduring outcomes

Since programs of pre-vocational education are of relatively recent origin it has not been possible to examine systematically any enduring outcomes of programs in this field. However, the importance of these outcomes should be stressed. The enduring effects of schooling have been acknowedged to be a neglected area of research (Härnqvist, 1977) largely because of the practical difficulties and expense of establishing contact with participants some years after a program has been completed. A recent publication which reviews American research in this area possibly constitutes an indication of aroused interest (Hyman *et al*. 1977).

Typical enduring outcomes of pre-vocational education would include general adjustment, job success and satisfaction, work motivation, job planning competency and short term job orientation.

It is the contention of this report that a great deal of theoretical development is still required to adequately define the variables to be used as criteria for evaluating the enduring effects of these educational programs. Härnqvist (1977) categorized the studies of enduring effects which he reviewed as those primarily concerned with values and attitudes and those mainly concerned with the attainment of occupational status and income. Consistent with the view adopted in the role of pre-vocational education in the transition from school to adult life, we believe that these types of criterion can be augmented with some more general measures of satisfaction. Recent research involving varied approaches to assessing the quality of life experienced by people (Andrews and Withey, 1976) and the structure of well-being (Burt *et al*., 1978) offer the prospect of even broader approaches to the enduring outcomes of these programs.

Table 5.2 The Main Elements of an Evaluation Strategy for Pre-Vocational Education

General Category	Major Element	Element
Antecedents (Background Factors)	Student Characteristics	Motivation
		Career Plans
		Previous Schooling
		Home and Social Background
	Teacher Characteristics	Industrial Experience
		Teaching Qualification
	Context	Employment Opportunities
Transactions (Processes)	Environment and Method	Realistic Working Conditions
		Integration in Teaching
		Practical Emphasis
	Student Reaction	Satisfaction
		Interest
Outcomes	Immediate Outcomes	Technical Competence
		Self-esteem and Occupational Identity
		Attitude to Work and Career Maturity
	Intermediate Outcomes	Employment rate
		Job Stability
		Job Satisfaction

The Framework in Retrospect

In this chapter we have attempted to combine many aspects of the rationale and objectives of programs in pre-vocational education, with a consideration of important issues in program evaluation. As a result a systematic framework has been derived which incorporates the important issues associated with the role of pre-vocational education in the transition from school to work. The important general categories of elements of the framework were background factors, processes, and immediate, intermediate and enduring outcomes. In Table 5.2 the elements of the framework have been summarized.

As indicated in Chapter Four, evaluation studies in pre-vocational education could be concerned with description and/or judgment. Studies concerned with description might focus on the logical contingencies between each of the elements, the empirical contingencies between them, or the congruences between intentions and observations with respect to each. Studies concerned with judgment would compare the observed nature of each element with a defined standard: either another group or an ideal. Most commonly judgmental studies would involve the outcomes of a program. Chapter Seven will deal with issues of analysis involved in such studies.

CHAPTER 6

STRATEGIES AND INSTRUMENTS

It seemed appropriate to begin a discussion of strategies and instruments which could be used in conjunction with the previously described framework, with a few general comments. Following these general comments is a summary of the first trials of some instruments. The more detailed section of the chapter consists of a discussion of the student, teacher and career questionnaires. It is a little more technical than previous chapters. A series of tables at the end of this section provides a summary of how data about each element has been collected. It should be stressed that there will be methods of gathering the requested data which were not tried as part of this project, but which will probably emerge from future studies. The chapter concludes with a discussion of procedures for sampling students and for the administration of questionnaires.

General Comments

In the previous chapter interviews with staff and students and observation of teaching were mentioned as techniques which were used in the development of an evaluation framework. Those same techniques could be applied as means of gathering data as part of an evaluation strategy. A recently published source-book of instruments for evaluating classroom instruction contains a valuable review of a number of observation and interview schedules as well as questionnaire materials (Borrich and Madden, 1977). The observation schedules were classified according to whether they focused attention on teachers, students or the class. Not all the schedules reviewed would be appropriate for programs in Technical and Further Education. It seems important that evaluation studies of processes in such programs as pre-vocational education should concentrate on various aspects of integration with the world of work, integration with society and integration between elements of the program rather than on general issues of classroom interaction. Few of the schedules reviewed appear to involve these issues directly. In developing the guide used for the preliminary observation of pre-vocational classes, the scales of Fordham (1977) concerned with emphasis on integration were helpful, as were the teacher's role categories of Gump (1967). However, the instrument which was used in this study was only to guide preliminary observations.

Most of the instruments developed or adapted in this study have been questionnaire materials or tests. This policy was followed because it seemed that such materials would be capable of providing rapid feedback of information to Technical and Further Education authorities. Having made that statement, it is necessary to issue the qualification that in most cases the value of such instruments would be enhanced by the complementary use of some less formal methods of gathering evidence.

We believe that evaluation in Technical and Further Education will prove to be of greatest benefit if different studies use some common items in the questionnaires which are used. The use of such marker items would enable synthesis of important results to be more readily achieved. This sentiment was expressed in the introduction to the collection of survey instruments used in the study of regional Colleges of Advanced Education (Beswick and Harman, 1975:1-4). Indeed we found that collection of instruments helpful in developing some items in the questionnaires used in this study. Items from those questionnaires, or modifications of them, have been used in the extension of the Regional Colleges Survey known as the Career Development Project (Beswick *et al.* 1979) and as part of a national education survey conducted for the Committee of Inquiry into Education and Training (Beed, 1979). The form of some questions used by Beed involved more simple expression to suit the wider audience with which that survey was concerned. As a result of this co-operation a body of information on issues common to different courses is growing. This is valuable for comparative purposes. We therefore included some items in our student questionnaire from these sources though in several cases it was necessary to simplify further to suit our respondents. Of course there were many issues unique to pre-vocational education which could not be investigated in this way, but it seemed important to include some well-established items for comparative purposes. Other important sources of ideas were the study by Rosier (1978) and the Melbourne Careers Project (1978). As a result of the trials we found it was necessary to extensively modify some of the items we had intended to use as markers so that the level of language difficulty suited the students with whom our study was concerned. In spite of this, one criticism of the questionnaires which were developed and used in the present study would be that the level of language involved was still too difficult for students of pre-vocational education. In the final forms it was possible to retain a few marker items in addition to those which were either developed or extensively modified for this study.

For the assessment of some of the outcomes of pre-vocational education there were some standard instruments which seemed suitable. Where necessary, publishers permission was obtained to use these in the development of a methodology. Future use in other studies would require an agreement between the user and the publisher.

The following materials were either developed or used in the study of pre-vocational education.

1 A Student Questionnaire.

2 A series of Teacher Questionnaires with modifications to suit each of the four programs.

3 A Career Questionnaire for the follow-up of former students.

In addition a series of test materials relevant to the programs described in Chapter Three was tried and a questionnaire requesting basic information from students who did not gain a place in a course was constructed.

Trial Questionnaires

As part of the initial stages of questionnaire development trial forms were developed. The first trial was a trial of some potentially suitable instruments rather than of the total evaluation strategy. Subsequently, the questionnaires were revised and used in the main trial of the strategy.

A trial form of a student questionnaire focusing upon background factors and teaching processes of 137 technical college students in Victoria. Included in the sample were 88 students from a secretarial studies course, and 25 students from an electrical trades pre-employment course. Data analysis of the trial mainly involved simple frequency and cross-tabulation analysis together with some reliability estimate of scales.

Among the interesting results obtained from this group of students were the following:

1 The most important reason for leaving secondary school was a belief that it did not lead to good job opportunities.

2 Most of the students considered themselves average or above average in school work.

3 Nearly one-third did not have a specific job or career in mind when they left school, and nearly half did not intend to obtain a college qualification at that time.

4 Students rated job training as the most important reason for enrolling in their current course but almost equally important was the desire 'to study in a field which really interests me'. The ratings given to these two factors correlated moderately ($r = 0.37$) suggesting that extrinsic and intrinsic interest among these students need not be seen as in conflict.

5 Most students indicated that they were satisfied with their college, found their course interesting, and expected it to be useful for their intended occupation.

6 The items showing the greatest discrepancy between the emphasis given and the emphasis which students believed should have been given to various goals of education were 'the development of self-awareness and self-confidence' followed by 'the development of attitudes to assist in settling into a job'. In both cases less emphasis was actually given than students felt should be given.

7 On a number of aspects of their working environments students considered their college to be similar to work.

8 Very few students had jobs arranged prior to finishing their courses and most anticipated difficulty in finding a job. More than half indicated that they would leave the course if a suitable job became available. The factors reported to be most important in choice of job were, in order, interest, satisfaction, working conditions, and security.

9 At the time the questionnaire was administered most students either knew exactly the job they wanted or were deciding between two or three jobs. As most did not have a job in mind when they left secondary school this suggested that some development of career intentions may have occurred during their technical college course.

Since this was a trial, the sample was not carefully drawn and the results obtained should be treated with caution. For this reason the points listed above have been stated in general terms rather than in precise figures. Nevertheless they give an indication of the way a group of students in full-time technical college courses responded to these questions.

The data from the trial were not solely used to obtain data for statistical analysis of scales. When the trial questionnaire was administered a number of the project staff were present to observe and report difficulties students had with particular questions. Many alterations were made to the format and to individual questions in the questionnaire. The data analysis was also valuable. For example, the reliability of the scale which assessed the practical emphasis of courses was only moderate (alpha = 0.60) but was improved by omitting one item (alpha = 0.66). In addition to these specific changes to questions the questionnaire was restructured so that personal background data were sought after information related to the course.

In addition to the formal trial, consultations were held with staff in Technical and Further Education authorities about the structure of the student questionnaire.

The Attitude Scale of the Career Maturity Inventory (Crites, 1973) was also administered to a sample of students in Victoria as it was designed to measure important aspects of attitudes to work. There were 123 students from secondary or secondary technical schools, 118 in full-time TAFE work preparation courses, and 72 apprentices. The sample was chosen from areas of similar socio-economic status. From an analysis of the data the following conclusions were drawn.[1]

1 The scale was sufficiently reliable for use in research (alpha = 0.80).[2]

2 A factor analysis[3] did not yield results congruent with the theoretical foundation postulated by the author. Consequently it was not possible to use subscales.

3 Students in full-time vocational courses scored higher than those in general secondary courses.

Because of the inconclusive nature of the factor analysis, it was decided to conduct a further trial of the Career Maturity Inventory Attitude Scale with the students in the pre-vocational programs.

The teacher questionnaire, and the career questionnaire for former students were not subjected to a formal trial but reviewed by groups of people in the research branches of State Technical and Further Education authorities. As a result of that procedure many alterations were made before they were used in technical colleges.

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[1] See Appendix A.

[2] See Nunally (1967).

[3] Factor analysis provides a means of examining the construct validity of a scale or a series of subscales. For an introduction to the technique see Child, (1970).

The Student Questionnaire

The Student Questionnaire was designed to obtain information about background characteristics, processes and outcomes. It was planned that it should be able to be completed within one hour: the duration of most class lessons in pre-vocational education. In the planning and trial of the initial questionnaire it was apparent that the information being sought might require more time. Therefore a strategy was adopted for collecting the information desired without imposing too great a burden on the respondents. The questionnaire was structured in two sections: A and B. Section B consisted of two alternative forms: form B1 and form B2. In our study when the questionnaire was administered copies containing form B1 were given to one randomly chosen half of the students and copies containing form B2 were given to the remaining half of the students. This procedure enabled information to be collected on a wider range of variables than would have been possible within one hour if all students had to answer all questions. It was important that the total group of students be split at random for this procedure to provide useful information. The extent to which each random half is similar on other factors could be checked by using responses to the common Section A of the questionnaire.

A copy of Section A of the Student Questionnaire has been included as Appendix B. Form B1 contained the Coopersmith Self-Esteem Inventory (Adult Form C), and a scale measuring the desire for further development through work taken from the study by Bachman et al. (1971). Form B2 contained the Attitude Scale of the Career Maturity Inventory (Crites, 1973). The sequence of questions in, and the format of, the questionnaire were planned to suit the students who were to answer it rather than the framework described in the previous chapter. It is worth considering the questions and scales which form part of each of the main elements of the framework.

The background factors to which the Student Questionnaire was directed included student motivation, career plans, school background, and home and social background.

Student motivation

It is important to recognize that the reasons why students enrol in a course such as pre-vocational education are probably complex. An ultimate decision to embark on a course is most likely to be based on a number of influences rather than on a single reason. To obtain information about the relative strength of a number of influences on the decision to commence a pre-vocational program, a format similar to that used in the Regional Colleges Survey (Beswick and Harman, 1975) was adopted. Students first rated the importance of various reasons for starting the course on a five-point scale and then underlined the most important reason. For the study of pre-vocational education some of the items listed in the Regional Colleges study were deleted and others specific to pre-vocational education were included. Of special interest were the items which indicated the balance of extrinsic and instrinsic factors: to get training for a job and to study in a field of real interest. There is scope for a major study of the balance of extrinsic and intrinsic motivation among Technical and Further Education students but not in the present study. In the present study we have been able to glean only a superficial indication of these issues. Question 11 of the student questionnaire was included to provide the basic information about the reasons why students commenced their course.

For each stated reason it would be possible to use the ratings on the five point ordinal scale to obtain median values and thus determine the most important of the reasons for commencing the course. As a check on validity this could be compared with the reason most frequently underlined. The correlations between the ratings given to each reason could be calculated to enable the associations between various reasons to be studied.

Career plans

When the relevant aspects of students' career plans were discussed in the previous chapter, two important aspects were identified. One concerned the specificity of a student's career plans on entry to a course. The other involved the considerations that a student considered important in seeking a job. Such information, it was argued, should be used in planning course structure and content.

(a) Specificity. Questions about the specificity of students' career plans were included at several places in the student questionnaire. Question 5 is the most direct of these being concerned with the students' plans on leaving secondary school. It is directly comparable with a question from the National Education Survey (Beed, 1979). Additional information about the students' plans could be obtained from Question 27 which was modified from an item in the Regional Colleges Survey. Questions 24 to 26 also concern specificity of career plans but are directed to students in the course rather than background factors.

(b) Choice of job. In educational programs intended to facilitate the transition from school to work the factors important to students in a choice of job could be relevant. In Question 23 students were asked to rate the importance of a number of factors in the choice of a job. Some of the items in this question were used in a study by Rosier (1978). Most were developed for the present study and cover a wide range of possible factors which might influence the choice of a job.

School background

In Chapter Five it was argued that relevant aspects of school background in a study of pre-vocational education would include attainment, achievement, reasons for leaving secondary school, type of secondary school and experience of work.

(a) Attainment. Pre-vocational education has been generally intended to be a provision for those people leaving school after Year 10. It was therefore of interest to know to what extent places in the available programs were occupied by students who had continued their secondary schooling beyond this stage. Question 2 was concerned with the student's attainment.

(b) Achievement. The level of school achievement among entrants to pre-vocational education was of interest in examining the pattern of intake. This information was generally available from official sources and was not requested in the questionnaire.

(c) School type. The type of secondary school attended by students was indicated by the answers given to Question 3. It was relevant because of the well established differences in retentivity of different types of school.

(d) Experience. Even though pre-vocational education is intended to provide for students coming direct from secondary school it is possible that some students may have had experience of work away from school. Questions 6, 7 and 8 were directed towards obtaining this information. They are similar to items included in the National Education Survey (Beed, 1979).

(e) Leaving school. Different programs of pre-vocational education have made different claims about the students to whom the programs were directed. Some claim to provide for students who found secondary school unsuitable. Through Question 9 an attempt was made to elicit information about the reasons why students left secondary school. As for the reasons for commencing the course, it was decided to assess the relative importance of each possible reason by asking students to rate the importance of that reason for them on a five point scale. Some guidance about the items listed was obtained from Rosier (1978). Median ratings for each reason could then be calculated to provide an indication of its importance in the decision of students to leave school.

Home and social background

Home and social background has been considered to be a multifaceted construct. It has been considered to be made up of a group of variables: socio-economic status, ethnicity, family career influence, and peer group influence.

(a) Socio-economic status. The most commonly used index of the social level of an individual in a community is based on occupation. One approach used in Australia by Congalton (1969) has been to class occupations according to their perceived prestige in the community. A second approach, adopted by Broom, Jones and Zubrzycki (1969) was to develop an occupational classification in terms of the level of skill and reward involved as well as social prestige. Even though occupational status has been shown to be correlated with other measures of social standing such as education, income and subjective social class, the measures are not identical (Broom *et al*. 1968). In spite of the limitations associated with the use of occupational status as an indicator of social standing it is a measure on which relatively objective data can be obtained by questionnaire or interview.

Information about the social standing of participants in various educational programs will be of greatest value if compatable data are collected in different studies. For this reason we advocate the use of the classifications and scales developed in the Department of Sociology in the Australian National University. Three scales have been offered by Broom Jones and Zubrzycki (1969) for use in sociological and educational studies: a sixteen point scale, a coarser six point scale, and a nine point classification designed to differentiate rural and urban occupations.[1] A recent publication (Broom, *et al*. 1977) has explored further the characteristics of these scales.

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[1] An illustration of the distribution of fathers' occupation among pre-vocational students has been shown in Appendix C.

In this study we have used the sixteen point scale for coding purposes. A more exhaustive three digit coding would be time, and money, consuming to code. The sixteen point scale can be collapsed to give either of the shorter scales or used with weighted social status measures (Broom et al. 1977).

The validity of such a coding system depends upon obtaining accurate descriptions of occupations to be coded. For this reason it was necessary to request that the occupation of the person actually be stated, and a description be given where necessary. Questions relating to the occupation of parents and siblings can be considered intrusive of privacy. In the student questionnaire for pre-vocational education the questions relating to occupations have been placed at the end of section A so as not to arouse early hostility and so that they could be omitted without jeopardizing other data.

The socio-economic status of a student has usually been taken to be indicated by the father's occupation. In the present questionnaire the occupation of the student's mother and siblings were requested. This was not for use as an indication of socio-economic status but to enable the detection of association between the types of jobs taken or aspired to by members of the same family. Questions about the occupations of parents and siblings, and of the students' aspired to and expected occupation, can be found as Questions 35 to 40 of the student questionnaire.

(b) Other family. In the section above the assessment of socio-economic status has been discussed. Other aspects of family activities are relevant in considering the entry to vocational training. Among the influences considered important are the occupations of elder siblings, and parents. In this we have been interested in the extent to which students' aspirations were associated with the occupations of other members of the family.

(c) Ethnic groups. Given the multicultural nature of Australian society it would appear useful to know the ethnic origins of the students entering pre-vocational education. In seeking this information it is important to know not only the country of birth of the student but also that of the parents. In addition the length of time which those students not born in Australia have lived here provides valuable information. Questions 31 to 34 provided relatively direct means of asking for this information.

(d) Peers. An additional potential influence upon young people at the point of leaving school is that of their peer group. One means of obtaining information about peer influences is to ask what a student's best three friends from school are doing. For pre-vocational students eight possible activities were nominated so that students could indicate what their best three school friends were currently doing. Question 10 provided a means of obtaining that information.

Teaching Processes

In Chapter Five a number of important evaluation questions concerned with processes involved in programs of pre-vocational education were identified: working conditions, teaching methods, practical emphasis, satisfaction and interest and difficulties. Previously it had been argued that the study of such process elements was an essential part of an evaluation study. This section is concerned with the means of obtaining students' perceptions of the processes involved in pre-vocational education.

(a) Working conditions. In examining students' perceptions of their working conditions attention has been focused on a number of issues which were identified in Chapter Two as important contributions from the experience of work to adolescent development. These issues involved responsibility, doing 'worthwhile' tasks, making decisions, adult treatment, using modern equipment, and contributing to a joint effort. The format which has been used in Question 20 involved students rating on a four point scale a series of statements about aspects of typical working conditions for themselves, someone at work, and someone at high school. A sample statement has been included in Table 6.1. A study by Flude and Whiteside (1971) found that when students in printing apprenticeships were asked to rate themselves on a scale with respect to their perceptions of themselves as a student or as a worker, there was a shift towards the end of the scale designated 'worker' over the duration of the course. For the present study of pre-vocational education an attempt has been made to define the important aspects of work rather than to use a global perception, and ask for relative perceptions rather than to seek to detect changes over time. A principal component analysis of the responses to the questions concerned with college conditions showed that only the first principal component had an eigen value greater than one.[1] That component accounted for 46 per cent of the total variance. This evidence confirmed that these questions were measuring different aspects of the same dimension. Subsequent analyses suggested that a reliable scale measuring the extent to which college conditions were similar to the world of work

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[1] See Appendix C (Table C2)

Table 6.1 You and Your Work: Sample Statement

Consider the following statements about aspects of typical working conditions. Compare your working conditions with what you think the working conditions would be like for:

(i) a student in a secondary school, and

(ii) someone in full-time employment.

(Circle one number in each row)

	Never	Rarely	Sometimes	Often
Responsible for ones own work				
in college	1	2	3	4
in work	1	2	3	4
in high school	1	2	3	4

Note: A complete set of statements can be found in Appendix B.

could be formed from these items. It was found that the alpha reliability was 0.76. Scales which measured the perceived conditions for someone in high school could also be formed with alpha reliabilities of 0.71 and 0.73 respectively. The three scales could thus be used with some confidence.

For the study of pre-vocational education it was possible to use the median ratings for each domain relative to high school and college in addition to using aggregated scale statistics. An important premise underlying the types of pre-vocational education programs described in Chapter Three was that it was possible to simulate conditions at work. If students view their working conditions in this way then college conditions would be rated as more similar to work than to high school. The results obtained from this instrument have been discussed in Volume Two.

(b) Teaching methods. To obtain students' views of the teaching methods in pre-vocational education a scale was included as Question 19 which was developed around the theme of teaching methods related to the world of work. Three major domains were included within this notion: an emphasis on realistic tasks and examples, integration with the social aspects of work, and concern to develop mastery of skills. Examples of items from each of these three domains have been shown in Table 6.2. A total of 21 items was developed. The introduction to the items which has been used was intended to capture

Table 6.2 Teaching: Typical Items

Domain	Item
Realistic tasks and examples	Provides some work for students which is similar to what they would do when they finish the course.
Individual progress and mastery	Gives enough time to complete a job.
Social aspects of work	Discusses the relevance of topics for our society.

the essence of teaching methods in the program generally. It was based on the format 'think of a typical teacher' as used in another context in the Regional Colleges Survey (Beswick and Harman, 1975). If the same scale were being used to study a particular class or subject in a program a different stem would be used and revalidation would be necessary.

A principal components analysis of the responses of students in four pre-vocational programs from seventeen colleges showed that while four factors had an eigen value greater than one, the first component had an eigen value of 6.1 but the others were 1.6, 1.4 and 1.1 respectively. On the basis of a scree test (Cattell, 1966) it would seem valid to treat the scale as measuring a single dimension: the extent to which teaching methods were related to the world of work. A high score would indicate teaching methods which were strongly integrated with work while a low score would indicate that students viewed teaching methods as divorced from work.

Further analyses showed that the scale was very reliable with coefficient alpha = 0.86 but that items 10 and 20 appeared unrelated to the remainder.[1] If those items were deleted the alpha reliability would be higher still: perhaps reaching 0.88. All the items had mean values just a little greater than the midpoint of the range and standard deviations which suggested a good spread of responses. There was no item where the limits of the scale caused distortion.

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[1] Refer Appendix C (Table C4)
Item 10 'Sets deadlines for work to be completed'
Item 20 'Requires correct spelling and expression in written work'.

A factor analysis was conducted which involved a varimax rotation of all four principal factors with an eigen value greater than one to determine whether the internal structure of the scale reflected that which had been postulated.[1] The first factor was interpreted as representing teaching methods involving the use of realistic practical examples and tasks. The second of the factors appeared to be concerned with the emphasis on methods which facilitated the mastery of important skills. The third factor appeared to be one which reflected the social aspects of work as incorporated in teaching methods by the discussion of social relevance and the encouragement of co-operation. Finally, the fourth factor was one on which only item 20 had a loading greater than 0.3. Together with the fact that item 10 did not load on any factor, this confirmed the interpretation that these items which were concerned respectively with correct spelling and expression and the setting of deadlines were discrepant and should be deleted from the scale.

An alternative to using the full scale in the evaluation of teaching methods would be to form subscales based on the results of this factor analysis. Further work would need to be undertaken on this task but it would appear that subscales which were not independent, but which were reliable could be obtained. Of course considering the nature of the scales one would not expect independence.

(c) Practical emphasis. In order that students' perceptions of the practical emphasis in the courses could be evaluated, a press scale was developed following ideas of Stern (1970). The first attempt at this scale was included in the Victorian trial and found to have a moderate reliability. After modification for the main trial the scale was still only moderately reliable with a value for coefficient alpha of 0.52.[2] It would appear that the scale requires further development before it could be considered for use as a research instrument but that it could be used for preliminary explorations associated with the present study.

The scale was an attempt to look at the total environment of the program by incorporating the attitudes of peers and teachers. A high score would represent a practically oriented environment while a low score would represent an environment in which practical things were not strongly emphasized. It seems probable that the multifaceted nature of the dimension under investigation limits the reliability which could be achieved in such a scale.

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[1] Refer Appendix C (Table C5)

[2] Refer Appendix C (Table C6)

The item total correlations would certainly indicate that more than one attribute was being tested.

(d) Satisfaction and interest. In Chapter Five the reasons for examining student satisfaction and interest in programs of pre-vocational education were elaborated. Two approaches to the assessment of student satisfaction have been adopted. One approach, in Question 17, was to ask students the extent to which they agreed with a number of statements of complaint. The format was similar to that used in the Regional Colleges Survey (Beswick and Harman, 1975) but using the individual statements as modified in the Career Development Project (Baldock, Harvey and Langford, 1977) and the National Education Survey (Beed, 1979). It was based on the six items, each with five response categories, which formed a Likert scale. An analysis of the results obtained from 473 students in four pre-vocational programs from 17 colleges showed that the scale was a fairly reliable measure of satisfaction (alpha = 0.68).[1] Of course, in examining a program the response to individual items might prove an additional useful source of information. An alternative approach which was also included as Question 13 of the questionnaire was to ask students directly about their overall evaluation of the course. This question was the same as one used in the National Education Survey by Beed (1979) and could thus be used for comparison purposes.

Related to student satisfaction is student interest. Question 12, which is a marker question identical to one in the survey of regional colleges, asked students directly about their level of interest in the course. In Question 22 more detailed information about interest in particular areas was requested. In that question information was also sought about difficulty and demands, so that those issues could be separated from interest.

(e) Difficulties. An additional area concerning processes is that of the level of perceived difficulty which students have in certain general areas. In Question 21 they were asked to indicate areas which were difficult and the amount of help which they had received in those areas. Such information could be of value in planning for additional instruction in particular areas. The areas listed were based on those which have been the subject of comment about the competence of apprentices and other young workers.

Program outcomes

The evaluation of outcomes in the area of technical competence does not form part of the Student Questionnaire. Rather it derives from test results and ratings by others. However, the assessment of priorities among various goals of pre-vocational education and certain affective outcomes was a function of the student questionnaire.

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[1] See Appendix C (Table C7)

(a) Priorities. In Question 14 students were asked to indicate the emphasis given to a series of five general goals in their program and their opinion of the emphasis which should have been given to each of those goals. The idea for the question came from the survey of regional colleges (Beswick and Harman, 1975) though for the students in pre-vocational education different statements of goals and some simpler wording of goals have been used. In addition, after the Victorian trial, a different format of the question was adopted to enable students more readily to separate the two types of question being asked. In particular the response category 'not sure' was eliminated as it appeared to cause confusion to students.

Median ratings could be calculated for both the actual and desired emphasis on each goal. The desired emphasis ratings could then be used to indicate the students' priorities and the difference between the two ratings to indicate a discrepancy score. It would appear that this type of question can provide valuable information. A large discrepancy score on a goal of high priority could indicate that some revisions to either course content or teaching methods were needed.

(b) Personal development: self-esteem. In the development of a methodology for evaluation the assessment of self-esteem of students has been attempted by means of the Coopersmith Self-Esteem Inventory (the S.E.I.). This instrument is based on a view of self-esteem as being:

> the evaluation which the individual makes and customarily maintains with regard to himself: it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful, and worthy. In short, self-esteem is a personal judgment of worthiness that is expressed in the attitudes the individual holds toward himself. (Coopersmith, 1967:4-5)

There are three forms of the S.E.I. available: a full 58 item instrument, a short form of 25 items, and an adult form of 25 items. The full inventory though intended for 10 to 12 year olds has been widely used throughout Australia for other age groups and has been the subject of extensive validation (Ross, 1974). It has 50 items designed to measure self-esteem, and eight items which form a lie scale. Ross showed that it was possible to use the instrument to give either a total score, or scores on three subscales: peers, parents and school. The adult form of the S.E.I. has been used less extensively in Australia and does not give scores on subscales but it has an equally impressive reliability. Coopersmith (1975) indicated a test-retest reliability of 0.88 and a correlation with the long form of 0.86.

Though less research has been reported in Australia using the adult form of the S.E.I., it has been preferred in the study of pre-vocational education for two reasons. Firstly, the wording is much more suitable for students in post compulsory education and secondly, it is shorter and less time consuming. Moreover it is possible to relate scores on the adult form to those on the complete form.

In the trial of the methodology among students of pre-vocational education it was found that the adult form of the S.E.I. had a satisfactory reliability (alpha = 0.76).[1] All the items correlated well with the total score, except items 2 and 19 which referred to a person's confidence in verbal expression. None of the items was such that more than 80 per cent of the students gave the same response. These results suggested that the instrument was suitable for studies of self-esteem among pre-vocational students.

(c) Personal development: occupational choice. Occupational choice as used in the present study has been taken to refer the extent to which individuals in pre-vocational education develop consistent patterns in their choice of future occupations. The method which has been tried in this study is an adaptation of an approach used in the Melbourne Careers Project (Kelso, 1978) following a method suggested by Holland, Gottfredson and Nafziger (1975) which was based on the theory of Holland (1973). According to Holland, occupations can be classified into six broad categories according to the environment of those occupations. The six categories, with examples, are: realistic (tradesmen), investigative (scientist), artistic (designer), social (teacher), enterprising (salesman, manager) and conventional (clerk). It has been argued that some types of occupational environment are more similar than others (Holland, 1973). In the study of pre-vocational education this framework was used to evaluate whether students had established patterns of future possible occupations consistent with the type of program in which they were studying. Hence, while such studies as the Melbourne Careers Project related stated possibilities to vocational aspiration, in the present project they were related to the program in which the students were enrolled.

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[1] See Appendix C (Table C8)

The question on which this approach has been based is number 28. The first stage was to assign the program to one of the six categories described by Holland (1973). Secondly, each stated possibility was coded as belonging to one of the same six categories. Thirdly, scores were assigned to each of the possibilities according to their proximity on Holland's hexagonal diagram (Holland, 1973:23) to the program classification:

If they were identical the score was 4.
If they were adjacent the score was 3.
If they were neither adjacent nor opposite the score was 2.
If they were opposite the score was 1.

Finally the scores were added and divided by the total number of possibilities. This procedure follows that of the Melbourne Careers Project (Kelso, 1978). In the present project it was possible to write a computer program to perform the third and final steps of the scoring.

Using this procedure the maximum possible score was four and the minimum would be one. A high score would indicate a range of future possibilities consistent with the type of program undertaken while a low score would indicate a scattered range of choices, many of which were not consistent with the program. It would seem that pre-vocational education ought to better acquaint students with the occupations consistent with the course of training they were undertaking. It is possible to interpret a high score on this measure as resulting from both a good understanding of jobs in an area and from the development of a sense of occupational identity.

(d) Attitudes to work: career maturity. The attitude scale of the Career Maturity Inventory (Crites, 1973) was tried with a view to assessing its suitability as an instrument for assessing one aspect of attitudes to work. It is one scale from a group of tests. The remaining scales comprise the competence test: self-appraisal, occupational information, goal selection, planning and problem solving. Even though the competence test may prove useful in other studies of pre-vocational education it was not used in the present development of a methodology. Permission was obtained from the publishers to try the Attitude Scale as part of the methodology.[1] The particular form of the Attitude Scale which was tried was the screening form.

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[1] Any subsequent use in evaluation studies would require an agreement with the publisher, CTB/McGraw Hill, Del Monte Research Park, Monterey, California, United States of America.

The items on the scale were structured around five dimensions: involvement in choice, orientation toward work, independence in decision making, preference for career choice and conception of the choice process. In total the scale is intended to measure maturity in attitudes towards a career. Fifty items scored in a true-false format make up the scale which is intended to assess an individual's maturity with respect to attitudes to careers. Crites (1973) has reviewed the source of the evidence from the United States involving its use. Its internal consistency (Kuder Richardson Formula 20) averaged 0.74, and the test-retest reliability was 0.71. In addition its validity had been examined using panels of expert judges to rate each item and by relating scores to a series of external criteria. In general it appeared to be both a reliable and valid instrument. In the present trial it was intended to check its reliability when used in pre-vocational education and to test its appropriateness for the evaluation of programs in this field.

As part of section B1 of the questionnaire it was administered to about one half (165) of the students in these programs. The internal consistency was found to be satisfactory for research purposes (alpha = 0.79). Mean scores were a little lower than might have been expected on the basis of United States norms. This was similar to the results obtained in the Victorian trial where full-time Certificate of Technology students scored higher than general secondary students. Neither group scored as high as the equivalent age group in the United States. A factor analysis was conducted to determine whether the five theoretical dimensions could be detected and a set of sub-scales derived. Seventeen principal components were extracted with eigen values greater than one suggesting that the scale samples many different facets of career maturity.[1] A factor analysis based on the rotation of five factors did not give a clear pattern which could be easily interpreted as representing the five theoretical dimensions. A Scree test suggested that three factors might be present. Therefore a factor analysis based on the rotation of three factors was conducted.[2] A tentative interpretation of the three factors appeared to be as follows:

1 The extent to which the respondents saw future opportunities as uncertain, and therefore the extent to which they were likely to have the opportunity to choose a job. A high score on this factor would

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[1] See Appendix C (Table C9)

[2] See Appendix C (Table C10)

reflect a perception of the future as stable, and the choice of job as a decision to be open to them.

2 The extent to which the respondents were oriented towards making a choice of career based on considerations of interest and commitment to the work, after seeking advice. This factor reflected the extent to which respondents looked forward to work. A high score would reflect a positive attitude to work and a commitment to make an informed choice of job.

3 The extent to which the respondents were personally certain in their choice of career. While the first factor involved a perception of the environment as stable, this factor was related to personal uncertainty. A high score would reflect a high degree of certainty about future jobs.

The emergence of a factor structure involving the first factor described above is probably a reflection of the changed employment market in Australia in recent times. While there was some correspondence between this structure and that which guided the development of the instrument, it was not clear. It was therefore not possible to use subscale scores.

Even though the attitude scale of the Career Maturity Inventory does not take long to administer it is lengthy in terms of the number of items. From the item analysis it appeared that some items were much better correlated with the total score than others.[1] This would suggest that it might be possible to develop a shorter instrument which measured the same general construct for use in survey studies of vocational courses. It should be remembered that the scale was developed for use with students in general secondary education in the United States, and validated among that group. Therefore it is not surprising that some differences in structure were found when it was used with pre-vocational students in another country. Any further use of the instrument would need to take these considerations into account. The construct being measured appears to be an important aspect of pre-vocational education, but it ought to be able to be assessed with a shorter instrument.

(e) Attitudes to work: development. In assessing the extent to which pre-vocational students express a desire to develop their skills and knowledge through work, a scale used by Bachman et al. (1972) was used. This was described by Bachman as measuring a need for self-development: a concept related to need for achievement but directed towards the idea of wanting to develop existing talents and acquire new ones. Bachman argued that the environment of educational institutions might affect student's expressed need for self-development in work. The instrument was a 15 item Likert scale. The results of administering the instrument to 204 students in pre-vocational programs suggested it was a reliable instrument in the Australian context. The alpha reliability was 0.84 and all the items were strongly correlated with the total score.[1] Together with the validity data reported by Bachman et al. (1972) this suggested that it could be a useful scale.

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[1] See Appendix A

The Career Questionnaire

The Career Questionnaire was intended to be completed by former students of pre-vocational education who had been in the workforce for about one year. Consequently it was designed so that it could be completed in about 15 to 20 minutes. Its format followed a logical sequence in time since the completion of the program of study. It began with questions about the person's first full-time job, then asked questions about changes in employment, enquired about the respondents present occupation, then asked people about how they felt about their job and concluded with an invitation to make retrospective judgments about the pre-vocational program which they had completed. In proceeding through the questionnaire there were two places where some respondents could omit some of the questions. Respondents who had not obtained a full-time job could omit Questions 1 to 11, and those who had made no changes in their job could omit Questions 7 to 11. A copy of the Career Questionnaire has been included in Appendix B.

As indicated in the development of the evaluation framework, the Career Questionnaire was intended to obtain information about four intermediate outcomes of pre-vocational educational programs.

1 Employment patterns

2 Job stability

3 Job satisfaction

4 Retrospective satisfaction with the program.

Employment patterns

In examining the employment patterns of people who completed pre-vocational education the Career Questionnaire has been concerned with more detail than rate of employment. Often State Technical and Further Education authorities maintain records of employment rates which can provide useful information. The questionnaire was concerned with the pattern of present employment among recent graduates, the pattern of first jobs among those people, and details of unemployment among those people.

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[1] See Appendix C (Table C11)

(a) Present employment. Questions 12, 13 and 14 concerned the present employment status of graduates. From responses to Question 12 (a) it was possible to determine the general level of employment among these people including whether the employment was full or part-time, permanent or temporary, and as an apprentice or not. Question 12 (b) sought more detail about the jobs of people so that it could be determined whether the work was in their field of training. The issue of 'misemployment' is a difficult one, and therefore respondents were asked to indicate whether they believed their present job was in their field of training. Finally, details about the period of employment for those who were unemployed were sought in Question 14.

(b) First employment. Similar information describing each person's first job as that about their present job was sought through Questions 2 and 5. In addition Question 3 asked about the time taken to secure a first full-time job and Question 4 asked about the source of that job.

(c) Unemployment. Even though information about current unemployment was obtained through Questions 12 and 14 it was also important to enquire about total unemployment. As requested in Question 15 this was taken to include time before obtaining a regular job and time spent as unemployed between successive jobs.

Job stability

In Chapter Five some reservations were expressed about the assumption that job stability among young people was necessarily a good thing. Since these reservations were held, questions were asked not only about job changes but about the nature of, and reasons for, those changes. Some of the questions in this section were adapted from similar items used in the Career Development Project.

(a) Job changes. Question 7 asked simply and directly for the number of different jobs a respondent had held since completing the course. It provided a direct, if simplistic, measure of job stability among graduates.

(b) Type of change. In Questions 8 to 11 information has been sought about the types of changes in employment made by the target population. The information being sought was related to two underlying dimensions: the nature of the change and the reasons for the change. The key issue in the nature of the job changes were whether the changes were within the same field, and whether the changes were towards a field more appropriate to the person's field of training. In examining reasons for changes two approaches were adopted. One was to ask for a brief but open ended statement while the other asked respondents to rate the importance of a series of possible reasons for changing jobs.

Job satisfaction

Measures of job satisfaction have been reviewed together with measures of other occupational attitudes by Robinson, Athanasiou and Head (1969). Among the range of scales which they reviewed was the Job Description Index developed by Smith et al. (1965). This index attempts to measure job satisfaction in the five areas of type of work, supervision, people on the job, pay and promotions. The first three areas are assessed by means of 18 item scales and the latter two by 9 item scales, making up a total of 72 items. The scales essentially comprise a check list of adjectives or descriptive phrases against which the respondent indicates an answer of 'yes', '?', or 'no'. Such responses are scored 3, 1 or 0 respectively. Several items are reverse scored and details are provided in Robinson et al. (1969)

There were four major reasons for trying this measure of job satisfaction in the development of an evaluation strategy for pre-vocational education. One was that it had been used in Australia among present and former tertiary students as part of the Survey of Regional Colleges (Beswich and Harman, 1975) and the Career Development Project (Baldock et al., 1977). There was therefore a possibility that some reference points had been established. The second reason was that it seemed a reliable and valid instrument on the basis of data from studies in the United States. Robinson et al. (1969) mention the extensive research which went into the development of the instrument and impressive reliability and validity data have been reported. Split half internal consistency measures above 0.80 are reported for each scale and a variety of validity studies have been conducted. The third reason for trying this instrument in the present project was its simplicity and uncomplicated terminology. Finally it appeared to be a face-valid instrument which did not take long to complete: factors which were felt likely to assist in obtaining a high rate of response.

The use of the instrument in the present project confirmed that it was highly reliable among young workers in Australia. Values of coefficient

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Table 6.3 Reliability of the Job Description Index and its Subscales

	Number of Items	Mean Score	Standard Deviation	Min.	Max.	Alpha Reliability
Subscales						
Work	18	31.1	11.8	2	49	0.87
Supervision	18	38.2	10.7	0	54	0.85
People	18	41.7	9.1	12	54	0.82
Pay	9	17.2	7.1	0	27	0.85
Promotion	9	14.0	7.5	0	27	0.85
Total Index	72	143.8	18.9	68	162	0.92

alpha which have been reported in Table 6.3 ranged from 0.82 to 0.87. As has been reported from United States data, the correlation coefficients reported in Table 6.4 suggest that the five scales are not statistically independent. This could be taken as an indication that general job satisfaction is being measured by the total score.[1] In fact coefficient alpha for the total instrument was 0.92. In trials associated with the evaluation of pre-vocational education both scale scores and total scores have been tried.

In summary the Job Description Index proved to be a reliable and useful instrument for assessing the job satisfaction of young workers who had completed programs of pre-vocational education.

Some data relating to the validity of the index were also obtained as part of the present project. Scores on each scale were obtained from a sample of people who had completed pre-vocational programs intended to lead to apprenticeship. It was then possible to compare the scores of those who obtained apprenticeships with those who did not. It would be expected that apprentices would report greater satisfaction, on the 'work' scale, and possibly the 'promotions' scale, than non-apprentices, but that there would

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[1] Robinson et al. (1969) recommended that those interested in fuller scoring details and normative data correspond with Prof. P.C. Smith, Bowling Green University, Ohio, USA.

Table 6.4 Inter-correlations between Subscales of the Job Descriptive Index

	Work	Supervision	People	Pay	Promotion
Work		55	51	48	31
Supervision			43	29	16
People				33	24
Pay					35

Note: Decimal points have been omitted.

be less difference on the remaining three scales. The results in Table 6.5 corroborated this proposition and supported the validity of the scales. In the case of the 'work' scale the difference was about three quarters of a standard deviation. On the 'promotion' scale the difference was about one half of a standard deviation, while for the 'pay' scale the difference was only about one third of standard deviation. For 'people' and 'supervision' the differences were trivial.

Retrospective satisfaction

As argued in Chapter Five it seemed that recent graduates of a program of pre-vocational education would be well placed to judge its effectiveness. In particular it was stated that this information would provide a good indication of how well the program had actually prepared young people for the work which they entered.

In Question 21 a series of eight ways in which such a program might have prepared people for work were listed. Respondents were asked to rate how well the program had prepared them in each respect. Median ratings on each aspect could then be calculated. It would appear that these ratings could be of value in evaluating particular aspects of a program. In addition the items were considered to form a scale of retrospective satisfaction with the program in general. Such a scale was found to have a satisfactory reliability (alpha = 0.83), and would appear useful in program evaluation studies.[1] The high internal consistency was an indication that former students who were satisfied with one aspect of their course were also

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[1] See Appendix C (Table C13)

Table 6.5 Mean Scores on Subscales of Job Description Index for Graduates of Courses Leading to an Apprenticeship

	Apprenticed			Not Apprenticed			F ratio
	Mean	Standard Deviation	N	Mean	Standard Deviation	N	
Work	34.47	11.27	39	24.92	14.13	24	5.789**
Supervision	37.32	9.36	39	36.58	13.01	24	
People	40.75	9.71	36	39.05	12.09	21	.340
Pay	15.83	7.86	36	13.14	6.96	22	1.748
Promotion	14.21	7.28	34	10.59	6.26	22	3.66[a]

** $p < .01$

a $p = .06$

satisfied with other aspects of their course. The median ratings on a five point response scale (1 = very well, 5 = very poor) were mostly between two and three. There was a fair spread of responses over the response categories available.

The Teacher Questionnaire

The questionnaire which was prepared for teachers to answer was also based upon the general framework of background factors, processes and outcomes. In the Teacher Questionnaire some questions more specific to particular programs were asked. Consequently it was necessary to prepare four different versions of the questionnaire, one for each program under review. The three forms, A, B, and C which were tried in the office-training, polytechnical and chemistry programs respectively differed in minor ways from each other. Form D, which was to be completed by the teacher responsible for the carpentry and joinery programs in each college, was substantially different from the other three forms though it contained some questions common to the others. A sample copy has been included in Appendix B.

The various teacher questionnaires have been given much less extensive trials and should be regarded very much as pilot instruments. In fact the only trial was in each of the colleges where the various pre-vocational programs were studied. The total number of teachers responding to all forms was only 42.

Background factors

Among the background factors about which information was sought from teachers were some concerned with the background of students and others concerned with the teachers.

Student's school background. In the case of the Office Training, Polytechnical and Chemistry Programs information was obtained from official records about course admission policies and the qualifications of those who applied and those who were admitted to the course. For the Carpentry and Joinery Program this information was obtained by questionnaire from each of the colleges (Questions 1 to 4). In studies involving programs conducted in a large number of colleges, the format used in Carpentry and Joinery would seem the better approach.

In addition to information of this type a question was devised through which teachers could indicate the extent to which specific difficulties were encountered by students in the course. This was included as Question 3 in Forms A, B and C, and as Question 8 in Form D. A sample has been included in Table 6.6. Median ratings accorded each of the problem areas could be taken as an indication of those aspects of students' backgrounds which teachers perceived as causing the greatest difficulty. Two other means of eliciting information about students' difficulties were tried. One was to ask teachers to estimate the percentage of students for whom each area was a problem. The other was to invite teachers to nominate the areas in which they thought students' backgrounds were deficient. To complement this teachers were asked in Question 9 to indicate whether certain areas were important for success in the program.

Teacher's background. In addition to asking teachers about their views of the students' backgrounds, some information was requested of teachers: their qualifications, work before teaching and teaching experience.

Teaching processes

Where possible it would seem desirable to obtain teachers' views of the teaching processes involved by using scales which are of a parallel form to those of the students. Hence a question about working conditions for students (Question 6) was included in Form A, B and C of the Teacher Questionnaire. In fact it was an early version of the question used in the Student Questionnaire and did not provide as much information as it might have. A series of items on which teachers could rate their own teaching was included as Question 7 but could not be analyzed as a scale because of the small sample size. This was

Table 6.6 Student Background Knowledge: Sample Item

Listed below are a number of difficulties which some students have when they begin a work preparation course. Could you

(i) indicate the extent to which these were problems for your students when they began this year, and

(ii) indicate the percentage of students for whom you thought this was a problem?

	Extent of Problem				Percentage Students
	Considerable	Moderate	Slight	None	
Problems of reading at a sufficiently high level	1	2	3	4	
Problems of spelling and written expression	1	2	3	4	
Problems of performing mathematical calculations	1	2	3	4	
Problems of verbal expression	1	2	3	4	
Problems with manual dexterity	1	2	3	4	

an early version of the Teaching Methods and Work Scale from the Student Questionnaire. A better approach would be to use the stem of Question 7 from the Teacher Questionnaire and the scale of items from the Student Questionnaire as modified from Question 19. This would give the opportunity to match student and teacher views of teaching processes.

In Form D of the Teacher Questionnaire used in the carpentry and joinery program more direct questions were asked about specific issues affecting the teaching processes in that program: principally the time spent on the construction program.

Program Outcomes

In the Teacher Questionnaire an attempt was made to obtain an assessment of the teacher's perspective of issues relevant to the program outcomes.

Priorities. An identical question to that on the Student Questionnaire which asked about the actual and desired emphases on five general goals was included in the Teacher Questionnaire with minor variations in wording and format (Questions A1, B1, C1 and D13). As for the Student Questionnaire both median ratings of importance and discrepancy values could be calculated. An additional question asked teachers to rate objectives specific to the particular course according to importance. A problem with this question would appear to be that where teachers are strongly committed to a program all objectives are rated as very important.

Immediate outcomes. In Forms A and B of the Teacher Questionnaire the only information about outcomes sought was an indication of the extent to which each objective had been achieved. Form C and Form D were directed to programs which were an alternative to part-time study. Accordingly teachers were asked to rate how well full-time students achieved each objective relative to part-time students (Form C, Question 2), or the level of attainment of pre-employment relative to Stage II apprentices in a number of areas (Form D, Question 7). In each case the purpose was not simply to obtain an overall relative rating but identify particular outcomes of each method of study to which attention might be given.

The Questionnaire to Rejected Applicants

A brief questionnaire was designed to obtain basic information from applicants who were not successful in obtaining a place in a pre-vocational course. The questions are simple and direct and the instrument is self-explanatory. A copy has been included in Appendix B.

Aptitude and Achievement Tests

Several problems existed in the evaluation of technical knowledge and competence as an immediate outcome of pre-vocational education. One means of evaluating immediate outcomes was through teachers' overall ratings of student performance, as described in the previous section. A second possible approach was to make use of suitable test material. Unfortunately there were few established tests of achievement suited to the programs under review. The development of achievement tests in trade and other occupational fields should be seen as an important priority. An alternative source of test results was to make use of those student assessments which formed part of the programs. These varied in type both between programs and between colleges offering the same programs. Some were very clearly based on the concept of mastery learning and criterion referenced assessment, others were not. In one program mastery testing was used for each section of the program so that a final result was in terms of successful completion only.

Many of the instruments and strategies discussed in this chapter so far have been applicable to pre-vocational education in general. The assessment of technical skills and knowledge is clearly an issue specific to particular programs. In the general description of the evaluation framework it was mentioned that some issues were general to pre-vocational education and others were specific to particular programs. It was argued that the strategy could be seen as adaptable in that specific outcomes of particular programs could be evaluated in addition to general outcomes of pre-vocational education. For this reason the choice of appropriate measures of student achievement would be a matter to be decided in relation to the particular program. It would seem important that any measure ought to be logically related to the intended outcomes of the program in terms of employment or further study. We would not advocate the use of general tests of literacy or numeracy, but rather tests of specific skills and knowledge in the occupational area.

In applying the evaluation strategy to the four programs mentioned, a number of instruments have been tried. Though they would not all be generally applicable it is worth describing the general features of them.

The Mechanical Reasoning Test

In the study of the Polytechnical Pre-Vocational Program the ACER Mechanical Reasoning Test was tried. This test is designed to assess a person's aptitude for solving problems which involve mechanical ideas. It is shorter and less verbal in content than the ACER Mechanical Comprehension Test taking just 20 minutes to administer. It is not considered suitable for students taking technical courses at an advanced level, but would seem to suit students of some pre-vocational education programs. It has been found to be a reliable instrument. Its internal consistency as calculated from Kuder-Richardson Formula 20 coefficients has been found to be about 0.8, and a coefficient of stability (test-retest) of 0.73 has been reported (ACER, 1979). In addition a revised edition with 1977 norms has been released.

The Mechanical Reasoning Test was administered to students in the Polytechnical Program. It was considered that such a test suited the general technical goals of that course. Of course it could also suit many mono-technical programs. Its potential value in such a program is twofold. Firstly, as a test of aptitude of apprenticeship training it could be considered as a measure of an outcome of a program designed to improve the aptitude of students for apprenticeship. Secondly, it would provide valuable information of the aptitude of students entering pre-vocational programs. Since it is more closely related to the skills involved in these programs it would be of greater value than general school achievement measures or general ability measures. In the 1978 trial application of the evaluation strategy it was administered towards the end of the year as an outcome measure. Other circumstances would permit its use as a pre- and post-test instrument and enable 'gain scores' or 'residuals of a regression analysis' to be used as the outcome measure. The latter appears to us to be a more useful procedure.

Eighty-five students of pre-vocational education completed the Mechanical Reasoning Test in 1978. The internal consistency (KR20) was found to be 0.81 which suggests that it is a reliable test amongst this group of students. It was also possible to correlate scores on this test with the other assessments made of students' performance by teachers as part of the normal program. Correlation coefficients have been recorded in Table 6.7. It can be seen that the achievement measures which correlated most strongly with Mechanical Reasoning were those involving Trade Practice and those which were least strongly correlated with it were those involving more general or academic subjects. This can be interpreted as evidence that the test was measuring mechanical aptitude. It should be noted that the correlation coefficients between the Trade Practice assessments and the Mechanical Reasoning were only moderate. Clearly, aspects of a student's ability other than mechanical aptitude would influence the skill they showed in the Trade Practice.

Chemistry attainment test

For examining the outcomes of the certificate course in chemistry use was made of results obtained by Fraser and Catts (1978) from a test developed by Fraser (1978).[1] This test was designed to test the basic chemical knowledge and skills possessed by students entering the chemistry certificate program. Students had been tested on entry to the program and at the conclusion of Stage II. All full-time and part-time students were tested. For full-time students this occurred at the end of one year while for part-time students this stage was reached after two years. As the relative merit of part-time and full-time study was an important issue in this program, this information was extremely valuable.

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[1] The full report by Fraser (1978) provides an example of the application of test development procedures.

Table 6.7 Correlations between Assessment Results and Mechanical Reasoning Test for Pre-Vocational (Polytechnical) Students 1978

	Comm. Skills	Human Rela.	Trade Prac. (4)	Trade Drwg (4)	Trade Science (4)	Trade Prac. (5)	Trade Calcs (5)	Mech. Reasoning
Comm. Skills		48	32	25	36	23	27	34
Human Rela.			31	28	46	39	32	24
Trade Prac.(4)[a]				12	32	35	27	43
Trade Drwg (4)					37	37	28	34
Trade Sci. (4)						29	46	29
Trade Prac.(5)[b]							44	54
Trade Calcs(5)								44

a Denotes Module 4

b Denotes Module 5

Note: Decimal points have been omitted.

The Chemistry Attainment Test had been carefully constructed and validated. Its reliability was high (KR20 coefficient = 0.80) and its validity seemed good. The test had been revised after item analyses based on classical test theory.

For our study the New South Wales Department of Technical and Further Education made available the results of this test in 1978. Use was made of the results obtained by full-time students and the results obtained by part-time students in the same colleges as the full-time students.

Carpentry and joinery

In the case of the program in the field of carpentry and joinery standard tests were not used in all the colleges offering the program. However, the School of Building in New South Wales had developed a series of test items to be used in constructing topic tests in each of the topics making up the program. With the help of a member of the curriculum section of the New South Wales Department of Technical and Further Education it was possible to construct a test of knowledge of carpentry and joinery. The test was planned so that it could be completed in one and a half hours. Items were chosen from a grid drawn up to ensure that the test represented all topics and skill areas in appropriate proportions. The grid has been shown in Table 6.8.

Table 6.8 Construction of the Carpentry and Joinery Achievement Test

Topic	Skill Knowledge	 Drawing	 Calculation	Total
Cladding	1		1	2
Roofing	1	1		2
Hip and valley roofs		1	1	2
Joinery, windows and doors	1			1
Steps, stairs and arches	1	1		2
Safety	2			2
Special joinery and fixing	2			2
Materials	2			2
Total	10	3	2	15

Because the test was constructed quickly it has not been validated or extensively tried. In the present study it was administered at the end of 1978 to pre-employment students and Stage II apprentices in the carpentry and joinery field. In this way it was possible to compare the achievement of the two groups of students.

Other achievement data

In addition to these tests use was made of the results of the various assessment procedures used as part of the various programs. Such information is often overlooked, but is an important part of program evaluation. In the office training the assessment was made in relation to clearly specified criteria and was therefore extremely useful in evaluating that program.

A Summary of the Instruments

In this chapter a Student Questionnaire, a Teacher Questionnaire, a Career Questionnaire and several tests have been described. Throughout the description of these instruments attention has been given to the information they were intended to provide about each element in the framework. To summarize much of the detail three tables have been presented. In Table 6.9, the data sought about background factors have been summarized.

Table 6.9 A Summary of Data Sought about Background Factors in Pre-Vocational Education

Element	Student Questionnaire	Teacher Questionnaire	Other
Student Motivation	SQ11	TQ3	
Career Plans			
(a) Specificity	SQ5, 24-27		
(b) Job choice	SQ23		
School Background			
(a) Attainment	SQ2		
(b) Achievement		TQ/D1-4	Records
(c) School type	SQ3		
(d) Experience	SQ6-8		
(e) Reasons for leaving school	SQ9		
(f) Pre-requisite skills		TQ/ABC3, 08	
Home and Social Background			
(a) Socio-economic status	SQ35		
(b) Other family occupations	SQ36-40		
(c) Ethnic background	SQ31-34		
(d) Peer activities	SQ10		
Teacher Characteristics			
(a) Work experience		TQ9	
(b) Education training		TQ10	
Employment Opportunities			Department of Employment Records

Table 6.10 contains a similar summary in relation to teaching processes, and Table 6.11 sets out the way in which information about program outcomes could be sought.

Administration and Sampling

The Student Questionnaire and tests

A significant problem for the collection of data by means of questionnaire from students in post-secondary education is that of attrition. If data is collected from students during the year then it will be biased because some students may have already withdrawn. It seems probable that those students who withdraw from the course would differ in some respects, such as their

Table 6.10 A Summary of Data Sought About Teaching Processes in Pre-Vocational Education

Element	Student Questionnaire	Teacher Questionnaire	Other
Working Conditions	SQ20	TQ6	
Teaching Methods	SQ19	TQ7	
Practical Emphasis	SQ18	-	CQ
Satisfaction	SQ17,12,13,22	-	
Difficulties	SQ21	TQ5	

satisfaction with the course, from their peers who continue. It seems that attrition rates vary considerably between courses and that in some areas of Technical and Further Education they are considered to be a problem (Brougham, 1978). Even though attrition in pre-vocational programs did not seem to be large it must be acknowledged as a problem for the collection of data. In another publication attrition rates in some pre-vocational programs have been reported. At this stage it is sufficient to note that most students who left these programs in 1978 did so to take a job. This observation not only suggests that the term 'dropping out' is an inappropriate description of student withdrawal, but also that the characteristics of those who withdraw may not be markedly different from those who continue.

The consequence of significant attrition rates is that some data should be collected from students on entry to a program. In particular data which are concerned with background factors should be collected on entry together with any aptitude measures related to outcomes. An additional reason for collecting these data at the point of entry to the program is that students may not be able to recall accurately their reasons for starting a course, or for leaving secondary school, etc., by the middle of the year. It would seem likely that students would express their reasons for enrolling in a way which rationalized that to which they were now committed.

Similarly it follows that data concerned with processes should be gathered during the year, after students have experience of the program, but before outcomes are assessed. Outcomes, of course, would be measured at the end of the year. These considerations imply a data gathering strategy in three stages.

Table 6.11 A Summary of Data Sought About Outcomes of Pre-Vocational Education

Element	Student Questionnaire	Teacher Questionnaire	Career Questionnaire	Other
Priorities	SQ14	TQ/ABC1,D13		
Immediate Outcomes				
(a) Personal Development: Self-Esteem	S.E.I.[a](B2)	TQ/ABC2		
(b) Personal Development: Occupational Choice	SQ28			
(c) Attitudes: Career Maturity	C.M.I.[b]			
(d) Attitudes: Self-Development	SQB1-15			
(e) Technical Competence		TQC2,TQD7		Tests[d]
Longer Term Outcomes				
(a) Employment Characteristics			CQ2-5,12,15	
(b) Job Stability			CQ7-11	
(c) Job Satisfaction			JDI[c]	
(d) Retrospective Satisfaction			CQ21	
(e) Success in Further Study				Records

[a] Coopersmith Self-Esteem Inventory.

[b] Career Maturity Inventory: Attitude Scale.

[c] Job Description Index.

[d] Tests used for each program have been described in the text.

In the present study all the data from students were collected at the one time. Because of the time at which the project commenced it was not possible to gather data from students before September. This was satisfactory for trial purposes but we acknowledge the twin sources of bias in the results obtained: attrition and rationalization of perceptions.

In the trial of the Student Questionnaire we were concerned with students in a limited number of colleges. In all the programs, except carpentry and joinery, we were able to administer the Student Questionnaire to all the students in the course at the time. Hence the question of sample design was only relevant to the carpentry and joinery program. For that program the

Student Questionnaire was administered to a sample of students chosen by a two stage sampling process. The two stages were:

1 a random sample of colleges offering the program, stratified so that equal numbers of metropolitan and non-metropolitan colleges were chosen, and

2 all the students of the pre-apprenticeship carpentry and joinery program in the colleges sampled.

This very simple design was followed because all colleges had the same number of carpentry and joinery students and that number was small (16).

In more extensive studies of programs conducted in a number of colleges more attention would need to be given to sampling. Sampling would be important when enrolments were so large as to make the administration of a questionnaire too costly. One approach which has been described by Ross (1976) is a two stage sampling design in which the two stages are:

1 a sample of colleges chosen with a probability proportional to the number of students in the program under review in that college, and

2 a sample of students (about 20) of the same size drawn from each sampled college.

Ross (1976) has shown how the sampling errors involved in such a design can be calculated from estimates of the intra-class correlation coefficients for an attribute.

In the present study two methods of administration of the Student Questionnaire were used. For two programs a Research Assistant was employed for this purpose while in the other two the questionnaires were administered by college staff. Even though the latter was less expensive the use of a Research Assistant proved a far more reliable means of obtaining the data.

The Teacher Questionnaire

As part of the approach to evaluation the Teacher Questionnaires described previously were developed. In three of the programs the Teacher Questionnaires were intended to be completed by all the teachers connected with the program, while in the fourth it was designed for the teacher in charge of the program because of the small numbers in each college. Several methods of administration were tried. At some colleges it was handed to each teacher after an interview for completion, sealing in an envelope and handing to the program co-ordinator. At other colleges it was handed to each teacher at the college with a stamped addressed envelope for direct posting to the researchers. Finally, at a few colleges it was posted to teachers at the college for reply post to the researchers. The first two methods were successful. The last was only successful for the questionnaires directed to the teacher in charge of the program. Lack of personal contact between the researchers and other staff seemed to reduce the proportion of questionnaires returned.

The Career Questionnaire

The purpose and structure of the Career Questionnaire have already been described. It was administered as a mail survey to samples of students from three pre-vocational programs. In each case the questionnaire was posted to home addresses and reminder procedures were instituted if a reply had not been received after two weeks. In total, three reminders were sent, the second being accompanied by an additional copy of the questionnaire. Care was taken in the reminder letters to emphasize the need to obtain a reply without being too aggressive. The response rate obtained, from an admittedly small sample, suggests that it is possible to obtain information in this way. Response rates have been shown in Table 6.12.

For graduates of the Office Training Program in Queensland, questionnaires were sent to all students from 1977 for whom addresses were known. In the case of the Polytechnical Program, questionnaires were sent to a sample of half the students from 1977 as the other half were already involved in a separate study. A simple random sample of fifty former carpentry and joinery students was drawn for study in that course. As a consequence, approximately equal numbers of former students from each of the three programs were approached.

The assessment of intermediate outcomes, and of enduring outcomes, raises the issue of whether longitudinal studies or cohort studies provide the best means of obtaining data. Longitudinal studies involve following one group of students through their course and career with a series of regular data collections. Cohort studies involve the study of different groups of students and former students with the assumption that little variation in the characteristics of each intake has occurred. The choice involves balancing costs and benefits. Cohort studies are both cheaper and provide more immediate results, but are based on the dubious assumption of stable entry characteristics. Longitudinal studies are generally more sound but do not provide immediate results and are expensive. It seemed that the characteristics of entrants to pre-vocational education did fluctuate each year so that

Table 6.12 Response Rates to the Career Questionnaire

	Office Training	Polytechnical	Carpentry & Joinery	Total
Questionnaires despatched	58	56	50	164
Questionnaires completed and returned	49	52	35	136
Percentage response	85	93	70	83

longitudinal studies would be preferable. However, in the present study which was of one year's duration, it was only possible to use cohorts, supplemented by a little information obtained about those students in the previous year.

It seems likely that concern about the privacy of data will grow over the next few years. A procedure which was evolved with the New South Wales Department of Technical and Further Education provided one means of respecting privacy but obtaining information. As part of that procedure names and addresses of former students were not sought by ACER. Rather ACER provided departmental officials with a set of guidelines for selecting a sample of ex-students and questionnaires to be sent to those people. The questionnaires, which had a code number on them, were sent to the respondents with a stamped addressed envelope for reply direct to ACER. When it was time for reminders to be posted ACER provided a list of code numbers not returned and reminder letters to be posted by departmental officials. The procedure was a little more time consuming than a direct mailing but it ensured that personal information could not be linked to individuals because the names and the information were held in separate locations.

A time sequence

In the previous section it was suggested that longitudinal studies were more appropriate for pre-vocational education than cohort studies. On this assumption a time sequence for the collection of data has been suggested.

1 At entry to the program information related to background factors should be collected together with appropriate aptitude measures.

2 At the middle of the program information about teaching processes and student reactions should be collected.

3 At the end of the program student outcomes should be assessed where possible in relation to the aptitude on entry.

4 After one year out of the course, information related to intermediate outcomes should be obtained.

5 After former students have been away from the program for five to ten years some assessment should be made of the enduring effects of the program.

It should be emphasized that while such a research project would last a considerable time, valuable information would become available after each stage in the sequence. Of course it would be possible to translate such a time sequence for a longitudinal study into a series of cohort studies with some loss of information.

In Summary

In this chapter a number of possible means of obtaining information about programs of pre-vocational education have been described. Characteristics, such as the reliability and validity, of a number of scales and instruments have been investigated and reported. Yet we have not attempted to be prescriptive in our recommendations. The techniques we have tried have been offered as but a few of a number of possible approaches to gathering data. a few seemed to be inappropriate, others needed further modification, yet the majority of those instruments we tried seemed to provide some reliable and valuable information. The important aspect of this chapter is that it attempts to show how appropriate methods of gathering data can be related to the major elements of an evaluation framework. It represents the culmination of a process which began with a consideration of the rationale for pre-vocational education and proceeded through a definition of important elements of an evaluative framework for pre-vocational education.

CHAPTER 7

FURTHER ANALYSES

Introduction

In developing a strategy for the evaluation of pre-vocational education programs a start was made by examining the main aspects of its rationale and the key features of four programs in this field. The results of this examination enabled general approaches to educational evaluation to be incorporated in an evaluation framework for pre-vocational education. Subsequently it was possible to identify the data which needed to be collected about each element of the framework and to suggest instruments which might be used for this purpose.

Descriptive data which could be obtained by means of the instruments described in Chapter Six were considered valuable in providing evidence about the way each program functioned. Of itself this evidence helped portray the program in operation and could thereby enable better informed decisions to be taken about its continuation. The value of accurate data obtained in this way is thus both historical and formative. Such data provide a record of the program and aids decision making.

When outlining the model of evaluation developed by Stake (1967) it was mentioned that evaluation involved both description and judgment. Description was taken to include rather broader activities than simply collecting information about a program. Three components of the descriptive phase of evaluation were identified: congruence, logical contingency, and empirical contingency. Congruence meant the extent to which intentions matched observations, and has been discussed as part of Chapter Six. Logical contingency referred to the extent to which it was reasonable to expect the intended outcomes to follow from the intended teaching processes, given the background factors which were presumed. This aspect of the evaluation was discussed as part of the rationale in Chapter Two. Empirical contingency referred to the relationships between the actual outcomes and the other elements of the framework. It is this aspect of the evaluation of pre-vocational education to which a large part of this chapter will be devoted.

Judgment was taken to involve comparing the program with a set of standards. Appropriate standards could either be an alternative program or an ideal set of criteria appropriate to the program under review. The latter part of this chapter considers some of the issues involved in reaching judgments about a program.

Describing Contingencies

In the previous chapters some variables relevant to the evaluation of pre-vocational education were identified and defined. In brief there were three blocks of variables: background factors, teaching processes and program outcomes. These three blocks of variables could be termed antecedents, mediators and criteria respectively. It will be recalled that both immediate and intermediate program outcomes were defined. For the present discussion attention will be confined to the immediate outcomes.

To gather appropriate data to evaluate the relationships between these aspects of a program it would be necessary to undertake a longitudinal study. Such a longitudinal study would need to involve students who experienced a range of different teaching processes. Probably a sample for such a study would need to be drawn from institutions providing different forms of pre-vocational education in the same field. Given that pre-vocational education is now expanding beyond a few pilot programs this will become possible. However, it should be remembered that the prescribed curricula for any program are fairly uniform across colleges.

It has been argued that programs of pre-vocational education involve multiple criteria and multiple predictors. There are several forms of analysis appropriate to such a situation. Even though we did not collect the longitudinal data necessary we have outlined one method of analysis which seemed to suit such a study. An appropriate form of analysis would therefore need to consider relations within each set of variables as well as relations between sets of variables. Under these circumstances canonical variate analysis would be an appropriate technique (Darlington _et al_., 1973). A computer program, CANON, developed by Cooley and Lohnes (1971) could be used to perform such an analysis.

In canonical variate analysis the first canonical correlation is the largest that can be found between a weighted composite of one set of variables and a weighted composite of the second. The composites are the first pair of canonical variates. The second canonical correlation is the next highest correlation between analogous composites which are not correlated with the first. Each successive pair of canonical variates can be tested for significance. The number of significant canonical variates indicates the number of different ways in which the two sets are related. Each canonical variate can be interpreted by means of the structure coefficients, which are the correlations between the derived canonical variates and the original variables (Tatsuoka, 1973). Moreover the strength of the association is described by the canonical correlation coefficient and the redundancy, or overlap between sets, can be obtained.

The framework for the analysis of pre-vocational education proposed three sets of variables rather than two. Keeves (1974) used canonical variate analysis in a similar study involving antecedent, mediator and criterion variables. Two canonical analyses were performed. The first involved the criterion variables as one set and a combination of mediator and antecedent variables as the other set. The second analysis involved the mediator variables as one set and the antecedent variables as the other. From these analyses it was possible to determine the nature and the magnitude of the relationships between and within each set of variables. In fact Keeves used the results of these analyses to estimate the strength of relationships in a path diagram.

At the simplest level the possible relations between the three blocks of variables involved in the framework for pre-vocational education have been shown in Figure 7.1. It should be emphasized that such an approach implies a summative assessment in that no account is taken of the recursive effects of outcomes on processes, or even background factors such as motivation.

In the previous two chapters each of these three blocks of variables has been described together with methods of obtaining data. More variables were included in those descriptions than would be appropriate in a canonical variate analysis. The purpose previously defined was that of providing a full description of the program. For examining relationships between elements greater parsimony would be required. This is particularly true of the block labelled background factors. Table 7.1 contains a list of possible variables which could be included in a canonical variate analysis intended to reveal

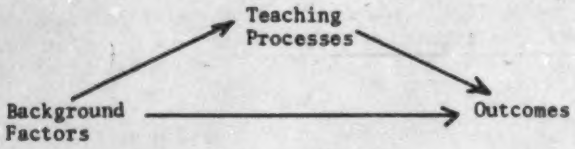

Figure 7.1 Simple Path Diagram: Pre-Vocational Education

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Table 7.1 Variables for Inclusion in a Canonical Variate Analysis of Pre-Vocational Education

Block	Variable	Comments
1 Background Factors	1.1 Job Motivation[a]	Obtained by rating of item 1 SQ11.
	1.2 Intrinsic Motivation[a]	Obtained by rating of item 5 SQ11.
	Aptitude	Obtained by a test such as ACER Mechanical Reasoning.[b]
	1.3 Socio-economic Status	Obtained from father's occupation.
	1.4 School Background	Obtained from records at school.[c]
	1.5 Career Specificity	Obtained by answer to SQ5.
2 Teaching Processes[e]	2.1 Working Conditions	Obtained from the score on the Working Conditions scale contained in SQ20.
	2.2 Teaching Methods	Obtained from the score on the scale contained in SQ19.[d]
	2.3 Satisfaction	Obtained from the complaints scale from the Regional Colleges Study (SQ17).
3 Outcomes	3.1 Technical Competence: General	Obtained from teacher ratings based on categories listed in TQD7.
	3.2 Technical Competence: Specific	Obtained from a test such as the Chemistry Attainment Test (Fraser, 1978).
	3.3 Personal Development: Self-Esteem[f]	Obtained from the Coopersmith Self-Esteem Inventory.
	3.4 Personal Development: Occupational Choice[f]	Obtained from the occupational futures instrument (SQ28).
	3.5 Attitudes to Work	Obtained from the Attitude Scale of the Career Maturity Inventory, or from another suitable scale.[g]

[a] Several other means could be used to obtain measures on these two variables. One would be based upon factor scores obtained from a factor analysis of responses to SQ11. Another could involve use of an established intrinsic motivation scale.

[b] This test would only be suitable for some occupational fields.

[c] In states where a moderated assessment is given in Year 10 it would be possible to use those assessments.

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[d] It should be noted that this scale was modified after the trial by deleting two items.

[e] It should be noted that the practical emphasis scale SQ18 was considered to be not sufficiently reliable.

[f] Either of these two variables could be included depending on the focus of the program. It would not in general be necessary to include both.

[g] It should be noted that the CMI attitude scale is a lengthy instrument whose factor structure we were not able to confirm. Shorter scales could be more appropriate.

the contingencies between elements. Those included are the variables we considered to be most relevant in the light of the rationale for pre-vocational education. Other studies might make use of different variables and different instruments for obtaining data. However, the outline does provide a basis for such modifications.

Based on this outline the appropriate canonical variate analyses could involve studying first the relations between the set of variables in block three and the combined set of block two and block one variables, and second, the relations between block two and block one variables. From such analyses it would be possible to determine the underlying relations within and between these blocks of variables.

Judgment

The second aspect of program evaluation in the approach suggested by Stake (1967) was that of judgment against a set of standards. It is important to note that judgment was considered to involve the elements described by Stake as antecedents, transactions and outcomes. In practice most evaluation studies have involved judgment of program outcomes, and often only one outcome. The discussion which follows has been heavily biased towards the judgment of outcomes because it seemed to be of most interest to Technical and Further Education authorities. However, the considerations outlined would be equally salient to the judgment of teaching processes, or transactions.

As previously mentioned standards for judgment might either be a set of criteria previously established or an alternative program. These two approaches could be considered analogous to the techniques of criterion references and norm referenced assessment. In program evaluation two types of criteria could be envisaged: criteria for individual participants and criteria for the program. Indeed in some senses the latter represent an aggregation of the former. For example, in an office training program it would be possible to define acceptable typing speeds as a criterion of individual success. A criterion for program success would then be a defined percentage of students succeeding on this task. Similarly, for a pre-apprenticeship program in mechanical engineering it might be possible to define skills which should be acquired at the conclusion of the course by individuals, and set a criterion for program success in terms of the percentage who should succeed in those terms. At a more general level, gaining employment in the field of training could be considered individual success and a defined proportion of graduates so employed taken to indicate program success.

Such an approach is feasible for a limited range of program outcomes, and is often used for that purpose in either a formal or informal way. We see three main problems in attempting to apply it more broadly in pre-vocational education. The first is that it is difficult to set levels of attainment for many important goals of pre-vocational education. Attitudinal goals provide an obvious example where such a procedure would be difficult, but there are also goals related to knowledge and skills in which it might be intended to provide an introduction rather than to develop mastery of a skill. The second main problem concerns the setting of appropriate levels for program success in terms of the proportion of students mastering an objective or goal. It would appear to be arbitrary to define such criteria as a proportion of graduates to gain employment. The third main problem is that a statement of program success in terms of such criteria fails to provide some very important information in planning pre-vocational education: the contribution of the program to the attainment of goals. In planning pre-vocational education it is important to know the relative effectiveness of different forms of program in a given field.

These difficulties apply to the broad application of criteria for program evaluation rather than to criterion referenced assessment of individuals. For some intended outcomes the percentage of students achieving a specified criterion would be a useful index of success. However, it seems better to use that in comparison with another group than to attempt to define an arbitrary percentage of students achieving success as a criterion.

In evaluating the effectiveness of a program of pre-vocational education it would often be necessary to employ less rigorous techniques than would be accepted in experimental research. As a consequence of employing such research designs it is often necessary to acknowledge the 'threats to internal and external validity' which are involved (Campbell and Stanley, 1963). A series of monographs developed by the United States Office of Education discusses methodological issues associated with the evaluation of outcomes of educational programs (Horst, Tallmadge, and Wood, 1975). In that series an approach to the selection of an appropriate model for the collection and analysis of data in the evaluation of program outcomes has been provided. The approach was concerned with comparing the program under review with either an alternative program or a set of norms. In outlining their approach the authors set out a seven-step decision tree culminating in five evaluation models as follows.

1 Where it was not feasible to employ a comparison group the norm referenced model was suggested.

2 Where there was a comparison group to which individuals were assigned at random, and where treatment and comparison groups could be matched on pre-test scores a post-test comparison of matched groups was suggested.

3 Where groups equivalent on relevant variables, rather than individuals, were assigned to each program, or where individually assigned pupils could not be matched covariance analysis was suggested.

4 Where individuals were assigned to different programs according to need determined by a test score a special regression model would be appropriate.

5 Where individuals were assigned to a program such that the comparison group had superior pre-test score a general regression model would be appropriate.

A subsequent publication in the series (Tallmadge and Wood, 1976) described a more simple classification of three categories: a control group category, a regression category and a norm referenced category. The control group category was considered the most rigorous but as noted it depended on the existence of an appropriate control. This category appeared to embrace the second and third models above depending on whether students were randomly assigned to groups, or whether each group was similar on relevant variables. The next most rigorous category was that where the analysis could be based on regression to allow statistically for the effects of initial differences between the groups. This category embraces the fourth and fifth models above. Finally, the least rigorous category of methods was the norm referenced approach corresponding to the first model listed above. It was acknowledged that for many evaluation studies only this model would be possible.

It is not possible to treat in detail each of the models proposed by Horst, Tallmadge and Wood (1975) and Tallmadge and Wood (1976) in this report. Rather we have chosen to refer readers to the original publications, the companion volume which is concerned with validating achievement gains (Tallmadge and Horst, 1976), and the accompanying series of guide books. It is worth emphasizing that this approach to evaluation offers a valuable recognition that an appropriate evaluation design depends heavily on the circumstances in which a program operates.

In pre-vocational education several comparison groups could be considered appropriate: apprentices, young workers, senior school students, and unemployed youth. An evaluation concerned with the relative effectiveness of pre-apprenticeship and direct entry to apprenticeship might use apprentices for comparison. If the main concern was with the general preparation for work, comparison with a group of young workers who had not experienced pre-vocational education would be more appropriate. In a study concerned with pre-vocational education as an alternative to secondary school, senior school students would be a more appropriate group for comparison. Finally, for a study concerned with alleviating the effects of unemployment a comparison group of unemployed youth would be more appropriate. In any of the cases it would be necessary to use one of the 'regression models' for analysis as the conditions for the 'control group models' would not apply: there would be no random assignment and there would be probably substantial initial differences on relevant variables.

As part of the development of the strategy for evaluation in pre-vocational education some data were collected. In general the norm referenced model was used to guide its collection and analysis. This was because the development work had such a necessarily broad focus that it was not possible to define a simple group for comparison. It was possible to make some comparative analyses in the case of the pre-apprenticeship program in carpentry and joinery and the chemistry certificate program, but these were limited and peripheral to the study.

Multiple Criteria

Procedures for collecting and analyzing data about program outcomes generally apply to single outcomes, or a series of outcomes treated separately. This comment would apply to the procedure described in the previous section. In previous chapters of this report it has been argued that programs of pre-vocational education have several intended outcomes and ought not to be judged on the basis of a single outcome. Any evaluation of such programs needs to consider various outcomes, and assign relative priorities to each. One approach would be to report the results obtained for each intended outcome separately. Those concerned with policy formulation could then take into account the relative importance of each outcome when taking decisions. A weakness of such an approach is that while reliable data might be provided about the achievement of outcomes, the assessment of priorities is made without any information for guidance. As a result the basis for deciding priorities may not be explicitly stated. In the discussion which follows a procedure is offered which would enable priorities to be included in an evaluation in a more formal manner.

In Chapter Four an approach advocated by Edwards, Guttentag and Snapper (1977) was briefly mentioned. That approach involved a consideration of the 'odds', or probability that goals were achieved, and the 'stakes', or the priorities attached to the achievement of those goals. Assigning numerical values to indicate the priorities attached to the goals was recognized as difficult. Edwards, Guttentag and Snapper mention the alternatives as being in a 'face to face' group or allowing individuals to list their own priorities for later combination. They note the concomitant benefits of the social process in a face to face group and cite an example of how that process was applied in a particular evaluation study. An important feature of this approach was the recognition that different groups of participants may assign different priorities to goals. Consensus was not necessarily a goal. Rather, divergent values could be used to show how the same data would lead to different judgments depending on the values assigned. They conclude that this leads to rich evaluation information.

In the present study an attempt was made to determine priorities by means of questionnaire. Though useful information was obtained, this procedure suffered because of the tendency of respondents to indicate several goals as being very important. A future development would be to use the questionnaire method first and to use the data obtained as a basis of discussion in groups to achieve greater discrimination between highly valued goals. Notwithstanding this problem, the procedure adopted allowed the views of a large number of participants to be considered.

As a measure of the attainment of goals, Edwards, Guttentag and Snapper suggested an approach based on probabilities that goals were attained. In fact they recommended a Bayesian approach, though it was recognized that alternative methods could be used to derive the same information. Such an approach supposes that goal achievement can be measured dichotomously; and the proportion of clients achieving each goal can be determined. While this approach could suit many evaluation studies it does not seem universally applicable. In many programs it would be necessary to consider the extent to which a goal was achieved. Consistent with previous comments in this report we believe many of the goals of pre-vocational education should be assessed on a continuous rather than a dichotomous scale.

It was noted in Chapter Four that writers such as Carver (1978) have cautioned against the use of probabilities arising from significance test as an indication of the extent to which a goal was achieved. In that chapter the arguments of Cronbach (1975) and others that the size of each effect should be reported were seen as appropriate to studies of pre-vocational education. Effect size was broadly defined as the difference between two measures of the one variable expressed in standard deviation units. It would seem useful to include measures of effect size within the general approach outlined by Edwards, Guttentag, and Snapper.

For programs of pre-vocational education such an adaptation would seem to be of great value. The use of effect size[1] measured in standard deviation units would provide that the extent of achievement of each goal was assessed on a common scale. Such measures could be combined with priority values to give an overall goal achievement index. It should be noted that to obtain data for such a procedure would require either the control group model or the regression model described previously. Note has already been made that these models are not always possible in evaluation. If the norm referenced model was used it would be possible to refer to standard deviations above a norm in applying the approach, but any conclusions drawn would be more tenuous.

Consider an illustration of how such an approach might be applied. Some fictitious data have been provided in Table 7.2. Those data refer to two imaginary programs of pre-vocational education in the same field. Suppose that one is a heavily theoretical program conducted in college, and that

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[1] The use of effect size has been discussed by Glass (1976).

It can be defined as $E = \frac{\overline{X}_t - \overline{X}_c}{S}$

where $\overline{X}_t$ = mean score for treatment group

$\overline{X}_c$ = mean score for control group

S = standard deviation

Table 7.2 An Hypothetical Example of The Decision Oriented Approach to Evaluation

Goal	Priority	Program A Effect Size	Program A Utility	Program B Effect Size	Program B Utility
Technical knowledge[a]	60	1.0	60	0.5	30
Technical skill[b]	80	0.5	40	1.0	80
Attitudes to work[c]	50	0.2	10	0.8	40
Personal development[c]	40	0.2	8	0.8	32
Total program			118		182

[a] For example measured on a test.

[b] For example measured by means of employer ratings.

[c] For example measured on appropriate attitude scales.

the other is strongly oriented towards personal development through simulated work experience. The priorities expressed represent imaginary values assigned by relevant participants in and designers of the program. They have been assigned a value on a scale from 0 to 100.

Achievement of each of the intended program outcomes has been expressed as an effect size in standard deviation units. Utilities for each goal were calculated by multiplying priorities by effect size. Total utilities are simply the sum of the individual goal utilities. On the basis of this hypothetical data Program B would be preferred to Program A. We emphasize that this was an illustrative example using fictitious data. It has been included only to illustrate the way the approach we have suggested might be applied.

As the main purpose of this study was to develop a methodology, longitudinal data necessary for the use of this technique were not able to be collected. Information about priorities was gathered and where appropriate, was combined with data about goal attainment. Within the constraints of the study the technique could not be applied rigorously.

In Conclusion

In this final chapter an attempt has been made to suggest means by which data gathered about each element in the framework could be used in further analyses. The analyses have been directed towards an examination of the relations between elements of the framework, and providing evidence in form suitable for guiding judgment.

As has been stated in the preceding chapters of the report the outline of possible analyses has not been exhaustive. The particular forms of analysis adopted will depend upon the roles and goals of a given evaluation study. The forms of analysis offered in this chapter constitute two approaches which seemed to allow the multivariate nature of pre-vocational education to be examined.

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APPENDIX A

SOME NOTES ON A TRIAL OF THE ATTITUDE SCALE OF THE CAREER MATURITY INVENTORY

Background

The Career Maturity Inventory (CMI) is an instrument developed by Crites (1969), and published by McGraw Hill, to measure the maturity of attitudes and competencies in making decisions about careers. Career maturity seemed to be an important outcome of pre-vocational education. The CMI provides two types of measures: the Attitude Scale and the Competence Test. There are five parts to the Competence Test:

- Self-Appraisal
- Occupational Information
- Goal Selection
- Planning
- Problem Solving

The Competence test is lengthy involving about 100 minutes. The Attitude Scale teakes only 20 minutes and is structured around five attitudinal clusters:

- involvement in the choice process
- orientation toward work
- independence in decision making
- preference for choosing a career
- conceptions of career choice

It was planned to examine the suitability of the Attitudinal Scale for the study of pre-vocational education. A preliminary trial was conducted in Victoria, and an additional trial was made using pre-vocational students in New South Wales and Queensland.

The Trials

The Attitude Scale was administered to a sample of 312 young people of age 16 in Victoria. Of this group 123 were in a general course of secondary education at Year 11, 117 were in full-time voational courses, and 72 were apprentices.

It was planned to examine the differences in scores between the three groups, and conduct a factor analysis of the results. In the second trial

Table A1 Scores for Sub-Groups on the Trial of the CMI Attitude Scale

Group	Number of Cases	Mean	Standard Deviation
Secondary students	123	34.2	5.5
Full-time vocational	117	37.4	4.7
Apprentice	72	35.2	5.1
All cases	312	35.6	5.3
American		38.2	

the scale was administered to 165 pre-vocational students in New South Wales and Queensland.

Scores for Each Sub-Group

The difference between the mean scores of each sub-group in the Victorian trial was significant with the vocational course students scoring highest and the general secondary students scoring lowest. In general the scores were lower than expected on the basis of American norms. The results have been presented in Table C1.

Reliability

The alpha reliability of the total score in the Victorian trial was found to be 0.80. From the second trial a reliability of 0.79 was found. Results of the test analysis are shown in Table C2 with item-total correlations.

Factor Analysis

From the Victorian trial the factor analysis proved inconclusive. There were 19 factors with an eigen value greater than 1. A Scree Test suggests the presence of five factors. When a five factor solution was obtained the factors did not appear similar to those suggested by the underlying theory. The factor loadings are shown in Table C3. A factor analysis of the results obtained in the second trial was equally inconclusive as reported in Appendix E.

Table A2 Item Statistics for the Attitude Scale of the Career Maturity Inventory - The Victorian Trial

Item	Mean	Standard Deviation	Item-Total Correlation	Item	Mean	Standard Deviation	Item-Total Correlation
1	1.95	.22	.16	26	1.69	.46	-.04
2	1.80	.40	.04	27	1.72	.45	.38
3	1.95	.21	.12	28	1.72	.45	.21
4	1.84	.36	.22	29	1.43	.50	.14
5	1.27	.45	.08	30	1.50	.50	.14
6	1.87	.33	.18	31	1.90	.29	.24
7	1.53	.50	.23	32	1.65	.48	.17
8	1.53	.50	.29	33	1.74	.44	.46
9	1.23	.42	-.07	34	1.71	.45	.09
10	1.73	.44	.27	35	1.21	.41	.08
11	1.51	.50	.22	36	1.74	.44	.29
12	1.91	.29	.21	37	1.70	.46	.44
13	1.41	.49	.08	38	1.92	.28	-.01
14	1.94	.24	.16	39	1.54	.50	.09
15	1.76	.42	.45	40	1.51	.50	.17
16	1.75	.43	.26	41	1.78	.41	.16
17	1.80	.40	.35	42	1.87	.33	.07
18	1.74	.44	.38	43	1.81	.39	.34
19	1.70	.46	.25	44	1.89	.31	.28
20	1.60	.49	.23	45	1.84	.37	-.05
21	1.52	.50	.12	46	1.85	.36	.03
22	1.86	.34	-.09	47	1.92	.27	.08
23	1.76	.43	.28	48	1.73	.45	.34
24	1.95	.21	.25	49	1.54	.50	.23
25	1.82	.38	.29	50	1.93	.25	.19

Conclusion

The Attitude Scale of the Career Maturity Inventory appeared to be a reliable instrument but its construct validity was unclear. Further work is needed on this aspect of the instrument.

Table A3 Results of the Factor Analysis of the Victorian Trial of the Career Maturity Inventory Attitude Scale

Item	Factor Loadings				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1					
2					(29)
3					
4					
5					
6					
7			68		
8			56		
9				40	
10	63				
11		30			
12		44			
13				40	-31
14					
15	55				
16	48				
17		39			
18	44				
19	51				
20		31			
21		30			
22					
23		33			
24					
25					
26					
27	54				
28	35				
29					
30					
31		47			
32		36			
33		50			
34		30		35	
35				41	
36		30			
37			(27)		
38					
39					-30
40					
41	36				
42					
43	53				
44					
45					(29)
46				-33	
47					35
48	56				
49	31			32	-31
50					

Note: Decimal points have been omitted and factor loadings less than 0.3 have not been recorded.

APPENDIX B

QUESTIONNAIRE MATERIAL

B1 The Student Questionnaire (Section A)

B2 The Career Questionnaire

B3 The Teacher Questionnaire
  - (a) Form C
  - (b) Alternative Format for Objectives in Form A
  - (c) Alternative Format for Objectives in Form B
  - (d) Form D

B4 The Follow-Up Questionnaire to Rejected Applicants

B5 Sample letter to Former Students

Notes

1 Only Section A of the Student Questionnaire has been included. Section B consisted of two alternative forms.

Form B1	The Attitude Scale of the Career Maturity Inventory
Form B2	(a) The Need for Self-Development Scale (b) The Coopersmith Self-Esteem Inventory

2 The Job Description Index has not been included with the remainder of the Career Questionnaire.

B1 The Student Questionnaire

AUSTRALIAN COUNCIL FOR EDUCATIONAL RESEARCH

Pre-Vocational Education Project

Form A Student Questionnaire

The purpose of this questionnaire is to learn a little from students in various courses about why they chose these courses, what they think about their courses, what they think about work and what are their plans for the future.

All the answers you give are confidential. We are not going to tell anyone 'who said what'.

It is important to answer each question carefully and honestly.

Leaving Secondary School

1	When did you leave secondary school? ... ... (Please give the month and the year)	___ (month)	19___ (year)	
2	In what Year or Form did you leave secondary school? ... (Please circle one number)	Before finishing Year 10	...	1
		Year 10	...	2
		Year 11	...	3
		Year 12	...	4
3	What type of secondary school was it?	Government	...	1
		Independent Catholic	...	2
		Independent non-Catholic	...	3
4	When you left secondary school did you plan to attend a Technical College?	Yes	...	1
		No	...	2

If YES, what sort of course were you interested in? ______________________________

____

5	When you left secondary school did you have a specific job or career in mind?	Yes	...	1
		No	...	2

If YES, please give details: ______________________________

____

6	Did you enrol in a Technical College immediately after leaving secondary school?	Yes	...	1
		No	...	2
7	Since leaving secondary school have you completed any other qualifications?	Yes	...	1
		No	...	2

If YES, please give details:

(a) Type of qualification: ______________________________

(b) Institution: ______________________________

(c) Year qualification was obtained: 19___

8 Have you worked full-time for more than six months at any time since leaving secondary school before commencing your present course? ... ...

Yes	...	1
No	...	2

If YES, please give details: ______________________________

____

____

9 Think of your decision to leave secondary school and consider how important each of the following reasons were in that decision. Circle 1 if the reason was very important to you and 5 if it was not at all important. Otherwise circle 2, 3 or 4, to show that the reason was fairly important, of some importance, or of little importance to you.

	Very important	Fairly important	Of some importance	Of little importance	Not important
My exam results (marks) were not good enough	1	2	3	4	5
School did not lead to good job opportunities	1	2	3	4	5
I had completed the studies needed to enter a Technical Course	1	2	3	4	5
I was not happy at school	1	2	3	4	5
I did not think I had enough ability to keep on studying	1	2	3	4	5
My parents did not want me to stay at school	1	2	3	4	5
I was tired of school and study	1	2	3	4	5
My parents did not think I had enough ability	1	2	3	4	5
I had sufficient general education	1	2	3	4	5
I did not like certain subjects	1	2	3	4	5
My teachers did not think I should continue	1	2	3	4	5
I had completed the highest Year at my school	1	2	3	4	5

Your School Friends

10 Could you tell us what your best three friends from secondary school are doing now? (Circle one number in each column)

	Friend A	Friend B	Friend C
Working in a job related to this course	1	1	1
Working in another job	2	2	2
Unemployed	3	3	3
Studying in this course	4	4	4
Studying at High School	5	5	5
Studying in another full-time technical course	6	6	6
I don't know	7	7	7
Other (Please say ____________)	8	8	8

Starting this Course

11 How important are the following to you as reasons for starting this course? Indicate your answer by circling the appropriate number opposite each reason.

	Very important	Fairly important	Of some importance	Of little importance	Not important
To get training for a job	1	2	3	4	5
To get a basic general education	1	2	3	4	5
To please parents	1	2	3	4	5
To fill in time until I decide what I want to do	1	2	3	4	5
To study in a field that really interests me	1	2	3	4	5
Because a job wasn't available	1	2	3	4	5
Other preferred courses were full	1	2	3	4	5
To be with friends doing the course	1	2	3	4	5
Because an apprenticeship wasn't available	1	2	3	4	5
As a preliminary course before entering another course (e.g. an apprenticeship)	1	2	3	4	5
To help determine what career I could follow	1	2	3	4	5

NOW GO BACK AND UNDERLINE THE MOST IMPORTANT REASON FOR YOU

The Course in General

12 How interesting do you find your course?

Very boring	...	1
Rather dull	...	2
Fairly interesting	...	3
Very interesting	...	4
Extremely interesting	...	5

13 What is your overall evaluation of your course?

Very satisfied with my course	...	1
Satisfied with my course	...	2
Uncertain	...	3
Dissatisfied with my course	...	4
Very dissatisfied with my course		5

14 A series of themes is listed below. For each theme you are asked to indicate:

(i) How much emphasis has been given to it in your course this year, and

(ii) How much emphasis, in your opinion, should have been given to it this year.

	(i) How much emphasis HAS been given to this?					(ii) How much emphasis SHOULD HAVE been given to this?				
	A great deal	Moderate	Some	Slight	Little or none	A great deal	Moderate	Some	Slight	Little or none
Emphasis on skills, knowledge and techniques for the practice of a future job	1	2	3	4	5	1	2	3	4	5
Development of self-awareness and self-confidence and an understanding of other people	1	2	3	4	5	1	2	3	4	5
Development of attitudes which will assist you to settle into a job	1	2	3	4	5	1	2	3	4	5
The ability to read, write and use numbers	1	2	3	4	5	1	2	3	4	5
Learning about our society	1	2	3	4	5	1	2	3	4	5

15 How useful is your course for the type of occupation you expect?

Very useful and relevant	...	1
Fairly useful	...	2
Not very useful	...	3
Of some slight relevance	...	4
Almost completely irrelevant and useless		5

16 In your present course how well do you do compared with other students?

Below average	...	1
Average	...	2
Above average	...	3
In top 20% of class	...	4
Near top of class	...	5

17 Listed below are some comments students sometimes make. Are these true of your course in general? (Circle one number in each row)

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
General work pressure is too great	1	2	3	4	5
There is not enough time for study	1	2	3	4	5
There are too many hours in class	1	2	3	4	5
There is too much emphasis on vocational training	1	2	3	4	5
Course demands too much mechanical learning and not much individual thinking	1	2	3	4	5
Too much like secondary school	1	2	3	4	5

How Practical is the Course?

18 Listed below are some statements concerned with the practical aspects of courses. Think about how well each statement describes the course you are doing. There is space alongside each statement to indicate your answer by drawing a circle around one number in each row.

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
Students are more interested in special (job) training than a general education	1	2	3	4	5
The atmosphere is practical and useful things are emphasized	1	2	3	4	5
Many subjects stress abstract ideas rather than real things	1	2	3	4	5
The courses here include many really practical subjects	1	2	3	4	5
Most students are interested in their future jobs	1	2	3	4	5
Many teachers stress the practical uses of their subject so that a student may apply what he has learned in a job	1	2	3	4	5
Learning to work with others is important here	1	2	3	4	5

Teaching

19 Think of a typical teacher (lecturer) at your college who is neither the best nor the worst in your experience. Indicate whether you agree or disagree with the following statements about him/her by circling the appropriate number opposite each item. Circle 1 if you agree strongly with the statement, and 5 if you disagree strongly. Otherwise circle 2 or 4 to show that you tend to agree or disagree, and circle 3 only if it is really impossible to decide.

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
Uses everyday practical examples of topics discussed	1	2	3	4	5
Provides some work for students which is similar to what they would do when they finish the course	1	2	3	4	5
Sets tasks which are useful and satisfying	1	2	3	4	5
Discusses the relevance of topics for our society	1	2	3	4	5
Discusses the usefulness and relevance of each topic for later work	1	2	3	4	5
States clearly the purpose of each piece of work	1	2	3	4	5
Explains things clearly at the students level	1	2	3	4	5
Enables you to work at your own pace	1	2	3	4	5
Gives enough time to complete a job	1	2	3	4	5
Sets deadlines for work to be completed	1	2	3	4	5
Actively involves students in lessons	1	2	3	4	5
Has motivated you to do your best work	1	2	3	4	5
Treats students as adults	1	2	3	4	5

19 (continued)	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
Encourages students to be responsible for their actions	1	2	3	4	5
States clearly the standards which are expected of students	1	2	3	4	5
Provides a lot of information about your progress	1	2	3	4	5
Lets you select topics, problems and examples	1	2	3	4	5
Encourages students to co-operate with each other in jobs	1	2	3	4	5
Encourages students to think about their future life	1	2	3	4	5
Requires correct spelling and expression in written work	1	2	3	4	5
Requires accurate calculations with numbers	1	2	3	4	5

You and Your Work

20 Consider the following statements about aspects of typical working conditions. Compare your working conditions with what you think the working conditions would be like for:

(i) a student in a secondary school, and

(ii) someone in full-time employment.
(Circle one number in each row)

			Never	Rarely	Sometimes	Often
Responsible for ones own work						
	in College	... ...	1	2	3	4
	in work	... ...	1	2	3	4
	in High School	... ...	1	2	3	4
The jobs and activities are worthwhile and useful						
	in College	... ...	1	2	3	4
	in work	... ...	1	2	3	4
	in High School	... ...	1	2	3	4
Being asked to decide how the job should be done						
	in College	... ...	1	2	3	4
	in work	... ...	1	2	3	4
	in High School	... ...	1	2	3	4
Being treated as an adult						
	in College	... ...	1	2	3	4
	in work	... ...	1	2	3	4
	in High School	... ...	1	2	3	4

20 (continued)

		Never	Rarely	Sometimes	Often
Being able to work with up-to-date equipment					
	in College	1	2	3	4
	in work	1	2	3	4
	in High School	1	2	3	4
Feeling part of a team					
	in College	1	2	3	4
	in work	1	2	3	4
	in High School	1	2	3	4

Problems

21 In this question we are interested in general problem areas you might have in your course and whether you have had enough help with them.

	Difficulties			Help		
	Generally yes	Sometimes	Generally no	Enough	Some	None
Mathematics	1	2	3	1	2	3
Reading	1	2	3	1	2	3
Writing	1	2	3	1	2	3
Practical skills	1	2	3	1	2	3
Other (describe)	1	2	3	1	2	3

____

____

22 In this question we would like to know about some of the subjects or activities which you do in the course. In the space provided list the subjects, or activity, which matches the description provided.

Most difficult ______________________________

Requires most work ______________________________

Easiest ______________________________

Most interesting ______________________________

Least intesting ______________________________

Choosing a Job

23 How important are each of the following in choosing a permanent occupation?
(Circle one number in each row)

	Very important	Fairly important	Slightly important	Not at all important
There is good pay	1	2	3	4
The opportunity to work outdoors	1	2	3	4
It is interesting work	1	2	3	4
The occupation is useful to the community	1	2	3	4
Working with people	1	2	3	4
The occupation has high status in the community	1	2	3	4
There is good opportunity to travel	1	2	3	4
Helping other people	1	2	3	4
It is an occupation with security	1	2	3	4
The work is satisfying	1	2	3	4
Being my own boss	1	2	3	4
The occupation has good working conditions	1	2	3	4

Your Immediate Plans

24 How definite are your plans for a job?

I have a job arranged for when I finish the course	1
I know exactly the kind of job I want	2
I am trying to decide between two or three different kinds of jobs	3
I am considering more than three different kinds of jobs ...	4
I do not have any specific jobs in mind at this time	5

If you have a job arranged please describe it: ______________________

____

25 If a job became available during your course would you leave the course to take it?

Yes ...	1
No ...	2

If YES, please give details: ______________________

____

26 How easy or difficult do you think it will be to get a job suitable to your training when you have finished your course?

Does not apply (I have a job arranged)	1
Very easy	2
Fairly easy	3
Difficult	4
Very difficult	5

27 When was your choice of future job made?

No choice as yet	1
While in primary school	2
While in secondary school	3
At the time of completing secondary school	4
After being unable to get into field of first choice ...	5
Some time after starting in the present course	6

Your Future Possibilities

28 We would like you to think about some of the jobs you might do.

- List all the jobs or occupations you could do and would like, if you were able to undertake the necessary training, and if you could get that job when you finished your training.
- List as many jobs as you can, but don't feel you have to fill every space.

I could do and would like the following kinds of jobs:

a ____

b ____

c ____

d ____

e ____

f ____

g ____

h ____

i ____

j ____

Some Background Information

Finally, in this section we would like you to give us some information about you and your course.

29 What is your sex? ____________

30 Your age? ____________ Years

31 In which country were you born? ____________

32 In which country was your father born? ____________

33 In which country was your mother born? ____________

34 How long have you lived in Australia? ____________ Years

In the following questions, please list the jobs of the people indicated. If you are able, please be as precise and detailed as possible (e.g. machine operator in a butter factory, senior clerk in a state government department, self-employed accountant).

35 Your father's (or male guardian's) occupation at present ____________

36 Your mother's (or female guardian's) occupation at present ____________

37 The occupation that you would like to have in 10 years time ____________

38 The occupation that you really expect to have in 10 years time ____________

39 The occupation of your eldest brother ____________

40 The occupation of your eldest sister ____________

In conclusion, we would like to know your name and address through which we might write to you next year when you have started work.

Your name: ____________

Your address: ____________

____

____

Thank you for your help.

B2 The Career Questionnaire

AUSTRALIAN COUNCIL FOR EDUCATIONAL RESEARCH
PRE VOCATIONAL EDUCATION PROJECT

Career Questionnaire

Last year you were a student in a full-time Technical College course. This questionnaire is part of a research project concerned with courses similar to the one you studied.

In this questionnaire we would like you to answer some questions about your present occupation.

Please answer these questions within the next few days and send the questionnaire back to us in the envelope supplied.

All the information you provide will be kept CONFIDENTIAL. Only the staff working on the project will see it. There is no need to record your name on the questionnaire.

For most questions you will need to draw a circle around the number next to the answer you choose. For a few questions you will need to write your answer in the space provided below the question.

YOUR FIRST FULL-TIME JOB

1 Have you obtained a full-time job since finishing your course last year?

Yes 1
No 2

IF NO, GO TO QUESTION 12. ➡
IF YES, CONTINUE ⬎

2 What was your first full-time job after finishing your course last Year? (include temporary jobs while waiting for your career job, if they were full-time).

____

____

3 How many months after you finished the course did you spend looking for this (your first) job?

_____________ Months.

4 How did you finally get this (your first) job?

Commonwealth Employment Service	1
Through personal contact (parents, friends, relatives)	2
Answered an advertisement in a newspaper	3
Applied direct to firm/factory	4
Commercial employment agency	5
College staff, counsellers	6
Other (please describe ________________ ________________)	7

5 Did you consider that your first job was in your field of training?

Yes	1
No	2

6 Are you still working for your first employer?

Yes	1
No	2

IF YES, GO TO QUESTION 12 →

IF NO, CONTINUE ↓

CHANGES SINCE YOUR FIRST JOB

7 How many jobs have you had since finishing your course?

One job	1
Two jobs	2
Three jobs	3
More than three jobs	4

8 Please describe the sort of change or changes you have made with regard to your employment since starting your first job.

Change ____

Reason ____

Change ____

Reason ____

9 Are you in the same kind of work as when you started your first job?

Yes 1
No 2
I am now unemployed 3

10 Which of the following best describes the type of work involved in the jobs which you've had?

All involved the same kind of work 1
My present job, and my first job are similar but between these I have done something different 2
I am at present unemployed 3

11 Consider your most recent change of employment (it may be your only change of employment).

How important were the following influences/considerations for your most recent change? Please indicate by circling the appropriate number, how important each of these reasons was in your decision. Circle 1 if it was very important, 2 if it was important, 3 if it was slightly important, 4 if it was relatively unimportant, and 5 if it was not at all important.

	Very important	Important	Slightly important	Unimportant	Not at all important
A job with better pay arose	1	2	3	4	5
Management (Boss) was difficult	1	2	3	4	5
Unhealthy working conditions	1	2	3	4	5
Unfriendly atmosphere	1	2	3	4	5
Dismissed (Firm closing or retrenchment)	1	2	3	4	5
Dismissed (other reasons)	1	2	3	4	5
No responsibility	1	2	3	4	5
Job not in my field of training	1	2	3	4	5
Not doing as well as friends	1	2	3	4	5
Boring town and people	1	2	3	4	5
Wanted to do more useful work	1	2	3	4	5
Wanted to follow a new interest	1	2	3	4	5
Lack of family encouragement	1	2	3	4	5
Other reasons (explain ________________ ________________________________)	1	2	3	4	5

NOW GO BACK AND UNDERLINE THE MOST IMPORTANT INFLUENCE FOR YOUR MOST RECENT CHANGE.

YOUR PRESENT OCCUPATION

➡ 12 (a) Which of these best describes your present occupation?

Working full-time in a permanent job	1
Working full-time in a temporary job	2
Working part-time	3
Working and training as an apprentice	4
Not employed, looking for work	5
Not employed, not looking for work	6
Home duties	7
Full-time study	8
Other (describe ____________________ ____________________)	9

(b) If you are working at present, could you describe your job? Please be as specific as possible (e.g. receptionist in a dental surgery, apprentice carpenter, postman), but there is no need to tell us the firm you work for.

____

____

13 Do you consider that your present job is in your field of training?

Yes	1
No	2
Does not apply	3

14 If you are unemployed, how long is it since you last had a full-time job?

Less than 1 month	1
Between 1 and 3 months	2
Between 3 and 6 months	3
More than 6 months	4
Does not apply	5

15 If you were to add together all the time that you have been unemployed since leaving school, how many months would that be?

Does not apply	1
A total of less than 1 month	2
A total of between 1 and 3 months	3
A total of between 3 and 6 months	4
A total of more than 6 months	5

HOW DO YOU FEEL ABOUT YOUR JOB?

Job Description Index

People in full-time employment: Please describe your present job in the following terms without regard to any course you may be studying.

Unemployed people (or people in part-time employment): Please answer with respect to your last regular job.

In the following 5 questions describe your work, the supervision you are given, the people you work with, the pay you receive, and your opportunities for promotion by circling the appropriate number to answer 'Yes', '?', or 'No' to each item. Circle 1 to answer 'Yes' if the item describes the particular aspect of the job (e.g. work, pay, etc.). Circle 3 to answer 'No' if the item does not describe that aspect, or 2 to answer '?' if you cannot decide.

Then followed as Questions 16 to 20 the five subscales of the Job Description Index developed by Smith (1965) and reported in Robinson et al., (1973). The number of items in each subscale are as follows:

16	Work	18 items
17	Supervision	18 items
18	People,	9 items
19	Pay	9 items
20	Promotions	9 items

A sample item from each subscale has been included here

		Yes	?	No
16	WORK			
	(a) Fascinating	1	2	3
17	SUPERVISION			
	(m) Knows job well	1	2	3
18	PEOPLE			
	(m) Unpleasant	1	2	3
19	PAY			
	(a) Income adequate for normal purposes	1	2	3
20	PROMOTION			
	(e) Good chance for promotion	1	2	3

YOUR COURSE LAST YEAR

21 We would like you to consider how well your course last year prepared you for work. A number of aspects of courses taken by students before starting work are listed below. Please indicate by drawing a circle around one number in each row how well your course prepared you in each of these aspects.

	Very Well	Well	Fair	Poor	Very Poor
The skills, knowledge and techniques in my job	1	2	3	4	5
Self awareness and self confidence and understanding other people	1	2	3	4	5
Attitudes in settling into a job	1	2	3	4	5
Basic skills of reading, writing and calculation	1	2	3	4	5
General knowledge of society	1	2	3	4	5
Experience of what work is like	1	2	3	4	5
Knowing how to obtain a job	1	2	3	4	5
Experience of working under pressure	1	2	3	4	5

22 Please write down any other comments about your work or your course last year.

____

____

____

Thank you for your help.

B3(a) The Teacher Questionnaire: Form C

AUSTRALIAN COUNCIL FOR EDUCATIONAL RESEARCH

Pre-Vocational Education Project

Teacher Questionnaire

The purpose of this questionnaire is to learn from teachers what they think about some aspects of the course they teach.

All the answers you give are confidential.

When you have completed the questionnaire, place the questionnaire in the envelope provided and seal it.

1 A series of issues in courses such as this are listed below. For each theme you are asked to indicate

(i) how much emphasis has been given to it in the course this year,

(ii) how much emphasis, in your opinion, should have been given to it this year.

Indicate your answers by circling the appropriate numbers opposite each issue. (Circle one number in each row.)

		A great deal of emphasis 1	Moderate 2	Some 3	Not much 4	Little or none 5
(a) Emphasis on skills, knowledge and techniques for the practice of a future job	Has	1	2	3	4	5
	Should have ..	1	2	3	4	5
(b) Developments of self-awareness and self-confidence and an understanding of other people	Has	1	2	3	4	5
	Should have ..	1	2	3	4	5
(c) Development of attitudes which will assist students to settle into a job	Has	1	2	3	4	5
	Should have ..	1	2	3	4	5
(d) The ability to read, write and use numbers	Has	1	2	3	4	5
	Should have ..	1	2	3	4	5
(e) Learning about our Society	Has	1	2	3	4	5
	Should have ..	1	2	3	4	5

2 For the Chemistry Certificate course there are a number of objectives specified for each subject in Stage I and II. On the following page there are some abridged statements of the main objectives. Could you please indicate the extent to which you think the objective is important, and how well you think full-time students perform in comparison to part-time students. (Note: Please give your estimates, do not try to be too precise).

Objective	How important is this objective?				How well do full-time students achieve this objective relative to part-time students?		
	Very imp.	Some imp.	Little imp.	Not imp.	Better	Same	Worse
- master a number of immediately useful laboratory skills	1	2	3	4	1	2	3
- develop a knowledge of laboratory procedures and safe working practices	1	2	3	4	1	2	3
- develop a good understanding of General Chemistry	1	2	3	4	1	2	3
- provide an understanding of relevant aspects of physics	1	2	3	4	1	2	3
- develop the mathematical skills and background needed by a technician	1	2	3	4	1	2	3
- develop a favourable attitude to, and interest in, the student's vocation	1	2	3	4	1	2	3
- improve vocational competence by developing basic communication skills	1	2	3	4	1	2	3
- (develop the ability to work rapidly and accurately in a laboratory)	1	2	3	4	1	2	3

3 Listed below are a number of difficulties which some students have when they begin a work preparation course. Could you

(i) indicate the extent to which these were problems for your students when they began this year, and

(ii) indicate the percentage of students for whom you thought this was a problem?

	Extent of Problem				Percentage Students
	Considerable	Moderate	Slight	None	
Problems of reading at a sufficiently high level	1	2	3	4	
Problems of spelling and written expression	1	2	3	4	
Problems of performing mathematical calculations	1	2	3	4	
Problems of verbal expression	1	2	3	4	
Problems with manual dexterity	1	2	3	4	
Problems of co-operation with teachers	1	2	3	4	
Problems of co-operation with other students	1	2	3	4	
Problems of motivation or interest in work	1	2	3	4	
Problems arising from a lack of basic scientific knowledge	1	2	3	4	

4 Please indicate the extent to which you think the following factors are important for students to be successful in this course.

	Very Important	Important	Of little importance	Not important
Level of ability in written expression	1	2	3	4
Level of mathematics ability	1	2	3	4
Breadth of general knowledge	1	2	3	4
Manual dexterity	1	2	3	4
Desire to qualify for a good job	1	2	3	4
Interest in the course	1	2	3	4
Emotional stability	1	2	3	4
High intelligence	1	2	3	4
Persistence	1	2	3	4

5 Are there any areas in which you think students from secondary schools are not as well prepared to this course as they should be. (Consider subject areas, general skills and knowledge and attitudes.)

(i) Area

Comment

(ii) Area

Comment

(iii) Area

Comment

6 In answering these questions we would like you to compare the working conditions of students in the course with the working conditions experienced by someone in full-time employment. (Circle one number in each row.)

		Never	Rarely	Sometimes	Often
Responsible for one's work					
	In college	1	2	3	4
	In work	1	2	3	4
The jobs and activities are worthwhile and useful					
	In college	1	2	3	4
	In work	1	2	3	4
Freedom to decide how the job should be done					
	In college	1	2	3	4
	In work	1	2	3	4
Being treated as an adult					
	In college	1	2	3	4
	In work	1	2	3	4
Being able to work with up-to-date equipment					
	In college	1	2	3	4
	In work	1	2	3	4
Feeling part of a team					
	In college	1	2	3	4
	In work	1	2	3	4

7 Listed below are a number of statements concerned with the teaching of full-time pre vocational courses. Could you indicate how important each is in the subjects you teach (i.e. your preferred practice) and the extent to which you are able to actually use this method in practice.

		Mostly	Frequently	Sometimes	Seldom	Never
The purpose of each piece of work is explained clearly	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Things are explained at the student level	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Practical everyday examples of topics are used	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
The usefulness and relevance of each topic for later work is discussed	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Students do tasks which are useful and satisfying	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Students are able to work at their own pace	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Students are expected to meet deadlines for work to be completed	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Students are treated as adults	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
The relationship between students and staff is friendly	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Students do some work which is similar to what they would do when they finish the course	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Students are encouraged to co-operate with each other	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
The relevance of topics for our society is discussed	Should be	1	2	3	4	5
	Actually	1	2	3	4	5

7 (contd)		Mostly	Frequently	Some-times	Seldom	Never
Students have learning experiences which are valuable in themselves	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Assessment is in relation to a standard (criterion)	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Students receive information about their progress frequently	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Extra assistance is provided for slower students	Should be	1	2	3	4	5
	Actually	1	2	3	4	5
Guidance about finding jobs is provided to students	Should be	1	2	3	4	5
	Actually	1	2	3	4	5

8 Would you mention any areas where the difference between what should happen and what does happen is greatest and indicate the reasons for the discrepancies (e.g. lack of time, lack of training, lack of resources)?

....

....

....

....

....

9 Could you provide some details about yourself?

9.1 The subject(s) you teach ....

....

9.2 Your sex ....

9.3 Your general feeling about the course ....

....

....

....

9 (contd)

9.4 Your qualifications ....

....

....

9.5 Your work before teaching (indicate jobs and how long).

....

....

....

9.6 The length of time you have been teaching ....

10 Finally, could you record your name so that if we ask for other information from you we can put it with this?

....

B3 Form D

TEACHER QUESTIONNAIRE

PRE-EMPLOYMENT CARPENTRY AND JOINERY COURSE

This questionnaire is part of a study of full time work preparation courses in technical colleges. Its purpose is to find out from the teacher in charge of Carpentry and Joinery a little about the pre-employment Carpentry and Joinery course.

All the answers you give are CONFIDENTIAL. Neither colleges nor individuals will be identified in any of the reports arising from this study.

We have asked for the name of your college only so that we can contact those colleges from which we do not receive a reply.

Name of College ____________________

SELECTION AND ADMISSION OF STUDENTS

1 How many students applied for a place in the pre-employment Carpentry and Joinery courses in your college which started at the beginning of 1978? (If more than one group commenced, include all groups) ☐

2 How many students were admitted to a place in the pre-employment Carpentry and Joinery course in your college at the beginning of 1978? ☐

3 Could you please describe the procedure used in selecting students for a place in the Carpentry and Joinery course? Please be as specific as possible by indicating the various stages involved in selection. If interviews were used, please indicate the main factors which were considered.

4 If school records are available could you record the students School Certificate results on the table on the last page. (Please note that no names are required)

Information available ...... ☐

Information not available .. ☐

WITHDRAWAL FROM THE COURSE

5 How many students have discontinued the course since it started? ☐

6 Could you indicate the occupational destination of those students who have left the course before completion? (e.g. apprenticed, working in hardware store, returned to school, not known)

1 ____________________
2 ____________________
3 ____________________
4 ____________________

STUDENT PERFORMANCE

7 Could you indicate your judgment of the level of attainment of pre-employment students after 36 weeks compared to stage II apprentices in each of the following areas?

	Pre-employment students are			
	better	about the same	worse	Comment
Knowledge of relevant theory	1	2	3	
Skills in building	1	2	3	
Ability to work quickly	1	2	3	
Keenness and enthusiasm	1	2	3	
Able to adopt to a new situation	1	2	3	
Independence	1	2	3	
Maturity	1	2	3	

8 Listed below are a number of difficulties which some students have when they begin a work preparation course. Could you

(i) indicate the extent to which these were problems for your students when they began this year, and

(ii) indicate the percentage of students for whom you thought this was a problem?

	Extent of Problem				
	Considerable	Moderate	Slight	None	Percentage students
Problems of reading at a sufficiently high level	1	2	3	4	
Problems of spelling and written expression	1	2	3	4	
Problems of performing mathematical calculations	1	2	3	4	
Problems of verbal expression	1	2	3	4	
Problems with manual dexterity	1	2	3	4	
Problems of co-operation with teachers	1	2	3	4	
Problems of co-operation with other students	1	2	3	4	
Problems of motivation or interest in work	1	2	3	4	
Other (please specify)	1	2	3	4	

COURSE STRUCTURE

9 What ADVANTAGES do you see in full-time pre-employment training in this course compared to a full apprenticeship?

10 What DISADVANTAGES do you see in full-time pre-employment training in this course compared to a full apprenticeship?

11 On average how much time is spent each week working on the construction site by each group of students? [days]

12 In your opinion should more time be available for the construction probject?

____

____

____

13 A series of issues in courses such as this are listed below. For each theme you are asked to indicate

(i) how much emphasis has been given to it in the course this year,

(ii) how much emphasis, in your opinion, should have been given to it this year.

Indicate your answers by circling the appropriate numbers opposite each issue. (Circle one number in each row)

	A great deal of emphasis	Moderate	Some	Not much	Little or none
	1	2	3	4	5
(a) Emphasis on skills, knowledge and techniques for the practice of a future job					
Has	1	2	3	4	5
Should have ...	1	2	3	4	5
(b) Developments of self-awareness and self-confidence and an understanding of other people					
Has	1	2	3	4	5
Should have ...	1	2	3	4	5
(c) Development of attitudes which will assist students to settle into a job					
Has	1	2	3	4	5
Should have ...	1	2	3	4	5
(d) The ability to read, write and use numbers					
Has	1	2	3	4	5
Should have ...	1	2	3	4	5
(e) Learning about our society					
Has	1	2	3	4	5
Should have ...	1	2	3	4	5

OTHER ISSUES

14 In your opinion, how much exemption from the term of an apprenticeship should be given to a student who has completed

(i) the 36 week pre-employment course?

No credit	1
6 months	2
12 months	3
18 months	4
21 months	5
24 months	6
More than two years	7

(ii) the 54 week pre-employment course?

No credit	1
6 months	2
12 months	3
18 months	4
21 months	5
24 months	6
More than two years	7

15 Please record any other comments which you think appropriate.

Thank you for your help.

B4 The Follow-Up Questionnaire

AUSTRALIAN COUNCIL FOR EDUCATIONAL RESEARCH
PRE VOCATIONAL EDUCATION PROJECT

Follow-up Questionnaire

Last year you applied for a place in a full-time Technical College course. This questionnaire is part of a research project concerned with courses in Technical Colleges.

In this questionnaire we would like you to answer some questions about what you have done this year.

Please answer these questions within the next few days and send the questionnaire back to us in the envelope supplied.

All the information you provide will be kept CONFIDENTIAL. Only the staff working on the project will see it. There is no need to record your name on the questionnaire.

For most questions you will need to draw a circle around the number next to the answer you choose. For a few questions you will need to write your answer in the space provided below the question.

1 (a) Which of these best describes your present occupation?

Working full-time in a permanent job	1
Working full-time in a temporary job	2
Working part-time	3
Working and training as an apprentice	4
Not employed, looking for work	5
Not employed, not looking for work	6
Home duties	7
Full-time study	8
Other (describe ____________________ ____________________)	9

(b) If you are working at present, could you describe your job? Please be as specific as possible (e.g. receptionist in a dental surgery, apprentice carpenter, postman), but there is no need to tell us the firm you work for.

____

____

2 If you are unemployed, how long is it since you last had a full-time job?

Less than 1 month	1
Between 1 and 3 months	2
Between 3 and 6 months	3
More than 6 months	4
Does not apply	5

3 If you were to add together all the time that you have been unemployed since leaving school, how many months would that be?

Does not apply 1
A total of less than 1 month 2
A total of between 1 and 3 months 3
A total of between 3 and 6 months 4
A total of more than 6 months 5

4 How many jobs have you had this year?

One job 1
Two jobs 2
Three jobs 3
More than three jobs 4
No jobs 5
Does not apply, I have been a student all year 6

5 If you are studying full-time at present what sort of institution are you attending?

Does not apply 1
Government High School 2
Non-Government School 3
Technical College 4
University or College of Advanced Education 5
Other (please specify ___________________ 6
_______________________________________)

6 If you have been a full-time student for only part of the year please indicate

(a) the period of time FROM ________________________(Month)
TO ________________________(Month)

and

(b) the sort of institution you attended (e.g. High School)

____

Thank you for your help.

B5 Sample letters

The Australian Council for Educational Research Limited

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Dear Former Student,

The Australian Council for Educational Research is conducting a research study of some courses conducted in Technical Colleges. One of the courses in which we are interested is the course at Technical College. As you were a student is that course last year we would be grateful if you could provide us with some information about the work you have done since finishing the course.

It would help us greatly if you could complete the attached questionnaire and return it to us in the envelope supplied.

All the information you provide will be kept CONFIDENTIAL. You will notice that your name is not to be recorded anywhere on the questionnaire.

The results which we obtain from the questionnaires will help us make recommendations about the improvement of courses similar to the one which you studied. It is important that all the questionnaires are returned to us promptly.

We would appreciate your completing and posting the questionnaire as soon as possible.

Yours sincerely,

John Ainley

John Ainley
Chief Research Officer

Enc.

200

A National Independent Educational Research Organization

APPENDIX C

ADDITIONAL RESULTS CONCERNING THE ANALYSIS OF SCALES USED IN THE STUDENT, CAREER AND TEACHER QUESTIONNAIRES

C1 Occupational Levels of Fathers of Pre-Vocational Students
C2 You and Your Work: Principal Component and Reliability Analysis
C3 Teaching Methods and Work: Principal Components Analysis
C4 Teaching Methods and Work: Item Performance
C5 Teaching Methods and Work: Factor Analysis
C6 Practical Emphasis: Item Performance
C7 Complaints Scale: Item Performance
C8 The Coopersmith Self-Esteem Inventory: Summary Statistics
C9 Career Maturity Inventory-Attitude Scale: Principal Components Analysis
C10 Career Maturity Inventory-Attitude Scale: Factor Analysis
C11 The Need for Self-Development Scale: Summary Statistics
C12 Occupational Futures: Computer Program
C13 Retrospective Satisfaction: Some Results

Table C1 Occupational Levels of Fathers of Students in Four Pre-Vocational Programs

	Occupational Level	No.	Per Cent
1	Upper Professional	12	3.1
2	Graziers	2	0.5
3	Lower Professional	25	6.4
4	Managerial	47	11.9
5	Self-Employed Shopkeepers	9	2.3
6	Other Farmers	15	3.8
7	Clerical	51	13.0
8	Armed Services and Police	6	1.5
9	Craftsmen and Foremen	113	28.8
10	Shop Assistants	5	1.3
11	Process Workers and Operators	16	4.1
12	Drivers	23	5.9
13	Personal, Domestic and Other Services	43	11.0
14	Miners	1	0.3
15	Farm and Rural Workers	5	1.3
16	Labourers	19	4.8
	Total Classified	392	100.0
	Not Classified	36	

Note: Classified on the six point scale the distribution of all those occupations classified would be:

	Category	Per cent[a]	
1	Professional	10	(10)
2	Managerial	18	(18)
3	Clerical and Service	15	(16)
4	Skilled	29	(29)
5	Semi-Skilled	11	(11)
6	Unskilled	17	(16)

[a] Percentages in parentheses refer to 370 full-time students only. Other percentages include 22 part-time students in the Chemistry Certificate program.

Table C2 You and Your Work: Principal Component and Reliability Analysis

Item (Brief version)	College 1st Principal Component Loading	College Item-Total Correlation	Work Item-Total Correlation	School Item-Total Correlation
Responsible	.68	.49	.44	.35
Worthwhile jobs and activities	.73	.55	.41	.48
Deciding how the job should be done	.60	.43	.40	.49
Treated as an adult	.68	.51	.47	.53
Up-to-date equipment	.66	.47	.45	.48
Part of a team	.69	.53	.46	.44
Reliability	.76[a]	.76[b]	.71[b]	.73[b]
Percent of Variance	45.6			
Eigenvalue - Component 1	2.74			
- Component 2	.89			

[a] Calculated from $\frac{n(\lambda-1)}{n(1-\lambda)}$

[b] Cronbach's alpha coefficient

Table C3 Teaching Methods and Work: Principal Components Analysis

Component	Eigenvalue	Total Variance Explained (%)
1	6.11	29.1
2	1.62	7.7
3	1.43	6.8
4	1.14	5.4
Total	10.30	49.1

N = 449

Table C4 Teaching Methods and Work: Item Performance

Item	1st Principal Component Loading	Item-Total Correlation Coefficient	Mean	Standard Deviation
1 Uses everyday practical examples of topics discussed	.42	.35	3.73	.94
2 Provides some work for students which is similar to what they would do when they finish the course	.52	.43	3.89	.96
3 Sets tasks which are useful and satisfying	.64	.56	3.67	1.02
4 Discusses the relevance of topics for our society	.55	.48	3.32	1.09
5 Discusses the usefulness and relevance of each topic for later work	.58	.50	3.80	.96
6 States clearly the purpose of each piece of work	.65	.55	3.61	1.16
7 Explains things clearly at the students level	.69	.61	3.61	1.16
8 Enables you to work at your own pace	.48	.43	3.24	1.26
9 Gives enough time to complete a job	.44	.37	3.35	1.19
10 Sets deadlines for work to be completed	.06	.06	3.58	1.12
11 Actively involves students in lessons	.68	.59	3.34	1.12
12 Has motivated you to do your best work	.67	.60	3.43	1.15
13 Treats students as adults	.59	.50	3.45	1.32
14 Encourages students to be responsible for their actions	.59	.53	3.91	0.88
15 States clearly the standards which are expected of students	.47	.42	3.97	0.89
16 Provides a lot of information about your progress	.59	.53	2.94	1.21
17 Lets you select topics, problems and examples	.44	.39	2.34	1.00
18 Encourages students to co-operate with each other in jobs	.62	.54	3.54	1.08
19 Encourages students to think about their future life	.60	.54	3.79	1.03
20 Requires correct spelling and expression in written work	.16	.15	3.35	1.24
21 Requires accurate calculations with numbers	.36	.32	4.12	.90
Reliability	.87	.86		
Scale statistics			74.02	11.82

Reliability (alpha) if item 20 deleted = .87
Reliability (alpha) if item 10 deleted = .87

N = 449

Table C5 Teaching Methods and Work: Factor Analysis

Item	Varimax Factor Loadings			
	F1	F2	F3	F4
1	34			
2	54			
3	60			
4			55	
5	52		35	
6	49		43	
7	44	33	40	
8		73		
9		61		
(10)				
11	48		43	
12	46	37		
13	37	33	34	
14	48			
15	38			30
16		35	45	
17			45	
18	33		49	
19			42	
20				73
21	43			
Eigenvalue	6.11	1.62	1.43	1.13
Percent Variance	29.1	7.7	6.8	5.4

Note: Decimal points have been omitted and values less than 0.3 have not been recorded.

Table C6 Practical Emphasis: Item Performance

Item	Item-Total Correlation	Mean	Standard Deviation
Students are more interested in special (job) training than a general education	.06	3.90	.99
The atmosphere is practical and useful things are emphasized	.39	4.00	.77
Many subjects stress abstract ideas rather than real things	.07	3.32	1.03
The courses here include many really practical subjects	.36	3.93	.87
Most students are interested in their future jobs	.22	4.23	.81
Many teachers stress the practical uses of their subject so that a student may apply what he has learned in a job	.38	4.06	.84
Learning to work with others is important here	.31	4.20	.84
Scale Statistics		27.65	3.07

Reliability (alpha) = 0.52

N = 475

Table C7 Complaints Scale: Item Performance

Item	Item-Total Correlation	Mean	Standard Deviation
General work pressure is too great	.44	2.71	1.15
There is not enough time for study	.35	2.63	1.23
There are too many hours in class	.36	2.78	1.22
There is too much emphasis on vocational training	.46	2.53	1.01
Course demands too much mechanical learning and not much individual thinking	.43	2.44	1.08
Too much like secondary school	.40	2.19	1.24
Scale Statistics		15.28	4.30

Reliability (alpha) = 0.68

N = 473

Table C8 The Coopersmith Self-Esteem Inventory: Summary Statistics for Item Performance

Item Direction		Mean Item Scores		Item-Total Correlations	
Category	Frequency	Range	Frequency	Range	Frequency
-	17	0.00-0.20	0	0.00-0.10	2
+	8	0.21-0.40	2	0.11-0.20	2
		0.41-0.60	9	0.21-0.30	7
		0.61-0.80	13	0.31-0.40	12
		0.81-1.00		> 0.41	2

Number of items = 25

Reliability (coefficient alpha) = 0.76

Scale Mean = 15.08 (items scored as 0 or 1)

Scale standard deviation = 4.65

Number of subjects = 175

Table C9 Career Maturity Inventory-Attitude Scale: Principal Components Analysis

Component	Eigenvalue	Percent Variance Explained
1	6.57	13.1
2	4.14	8.3
3	2.44	4.9
4	2.32	4.7
5	1.94	3.9
6	1.83	3.7
7	1.59	3.2
8	1.51	3.0
9	1.46	2.9
10	1.43	2.9
11	1.42	2.8
12	1.31	2.6
13	1.23	2.5
14	1.19	2.4
15	1.14	2.3
16	1.06	2.1
17	1.04	2.1
Total		67.3

N = 165

Table C10 **Career Maturity Inventory-Attitude Scale: Factor Analysis**

Item	Factor Loading			Item	Factor Loading		
	F1	F2	F3		F1	F2	F3
1		-41		26	49		
2				27			36
3				28			39
4	37			29			
5		-46		30			
6			28	31			
7			31	32			
8				33			35
9			25	34			
10			57	35			
11				36	38		
12			37	37	32		
13		-36	45	38			
14		-41	44	39			
15			69	40			
16	40	28		41		69	
17	56			42		47	
18	51			43	52	55	
19	32	35		44	45	62	
20	27			45		48	
21				46		53	
22			35	47		54	
23	42			48	41	58	
24	40	28		49	33	48	
25				50	40	61	
Eigenvalue					6.57	4.14	2.44
Percent Variance					13.1	8.3	4.9

Note: Factor Loadings less than 0.25 have not been recorded and decimal points have been omitted.

Table C11 The Need for Self-Development Scale: Summary Statistics

Mean Item Scores		Item Standard Deviations		Item-Total Correlations	
Range	Frequency	Range	Frequency	Range	Frequency
1.0-2.0	0	< 0.9	3		1
2.1-3.0	0	0.9-1.0	4	0.21-0.30	1
3.1-4.0	12	1.0-1.1	4	0.31-0.40	1
4.1-5.0	3	> 1.1	4	0.41-0.50	3
				> 0.50	9

Number of items = 15

Reliability (coefficient alpha) = 0.85

Scale mean = 55.97

Scale standard deviation = 8.52

Table C12 Computing Consistency Scores for the Future Possibilities Question

According to Holland (1973) occupations can be classified into six broad categories: realistic, investigative, artistic, social, enterprising and conventional. To represent the similarity of these occupations Holland has proposed a hexagonal diagram as well as a detailed classification of many jobs. Holland's hexagonal model with the coding categories used in the present study has been simply represented in Figure E12/1.

As discussed in Chapter Six this model provided a structure for examining student career choice in the Melbourne Careers Project following an approach developed at the Johns Hopkins University, Baltimore. In that project students' future possible occupations were scored according to how closely they resembled vocational aspirations. For the present project future possibilities were scored in relation to the congruence of those choices with the fields to which the course of study was directed viz:

Carpentry and Joinery and Polytechnical : Realistic
Office Training : Conventional
Chemistry Certificate : Investigative

Future possibilities were first classified according to Holland's six categories and then coded on computer. A procedure based on the SPSS system (Nie, _et al_., 1975) was devised as part of the present project to generate for each student

(a) proximity scores for each stated possibility, and

(b) an average consistency score for the list of possibilities.

The procedure also calculated the number of possibilities listed by each student. An outline of the main steps in this procedure is provided below. It was used in conjunction with the Statistical Package for the Social Sciences

Table C12 (continued)

(Nie _et al_., 1975) but could be applied to other packages.

1 The data on each of the 10 variables representing the listed possibilities, as coded into Holland's six categories was read.

2 Scores were calculated which indicated the proximity of each choice to the classification appropriate to the course of study. In this project the courses came from three classifications and this resulted in 30 new variables. The DO REPEAT and RECODE programs of the SPSS were used to perform this task. For example, to calculate proximity scores for office training the following recodings were required: 6 to 4, 5 to 3, 1 to 3, 4 to 2, and 3 to 1.

3 The total number of possibilities (N) listed by each respondent was calculated. The COUNT procedure was used for this.

4 The sum of all the proximity scores for each respondent was calculated using a summation procedure which terminated when the number of possibilities listed was exhausted. Three totals were calculated (TOFF, TREA, TINV) in the present project.

5 The average scores were calculated by dividing the sum of the proximity scores by the number of possibilities.

REFERENCES

Holland, J.I.
1973 _Making Vocational Choices: A Theory of Careers_
Englewood Cliffs, New Jersey: Prentice Hall.

Nie, N.H. _et al_.
1975 _Statistical Package for the Social Sciences_
New York: McGraw Hill.

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Table C13 Retrospective Satisfaction: Some Results

	Item-Total Correlation	Mean	Standard Deviation
1 The skills, knowledge and techniques in my job	0.47	3.92	0.99
2 Self-awareness and self-confidence and understanding other people	0.55	3.80	0.94
3 Attitudes in settling into a job	0.58	3.84	0.91
4 Basic skills of reading, writing and calculation	0.54	3.92	0.93
5 General knowledge of society	0.61	3.54	0.91
6 Experience of what work is like	0.59	3.84	1.02
7 Knowing how to obtain a job	0.54	4.05	0.96
8 Experience of working under pressure	0.60	3.33	1.20
Scale	alpha = 0.83	30.24	5.34

Note: 1 = very well
5 = very poor

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